



U.S. Department  
of Transportation

**National Highway  
Traffic Safety  
Administration**

400 Seventh Street, S.W.  
Washington, D.C. 20590

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If you requested NHTSA to query its database files in order to identify a specific crash, then that query was made using non-personal descriptors you provided for use in our search. This motor vehicle crash may have been identified from a data search and matches the general, non-personal descriptors you provided, but we cannot confirm that this is the specific crash report you requested.

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**TRANSPORTATION RESEARCH CENTER**

Indiana University  
Bloomington, Indiana 47405

**ON-SITE AIR BAG INVESTIGATION**

CASE NO. - 90-01  
FLEET - PRIVATE VEHICLE  
LOCATION - [REDACTED] INDIANA  
ACCIDENT DATE - [REDACTED] 1990

Submitted By:

[REDACTED]  
[REDACTED] t  
[REDACTED] 1990

Contract Number: DTNH22-87-C-07169

Prepared for:

U.S. Department of Transportation  
National Highway Traffic Safety Administration  
National Center for Statistics and Analysis  
Washington, D.C. 20590

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1. Report No. TRC/IU Case No. 90-01		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle On-Site Air Bag Investigation Fleet - Private Vehicle Location - [REDACTED] Indiana				5. Report Date [REDACTED], 1990	
				6. Performing Organization Code	
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7. Author(s) [REDACTED]				10. Work Unit No. (TRAIS)	
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15. Supplementary Notes On-site air bag deployment investigation involving a 1990 Ford Mustang					
16. Abstract <p>This report covers an on-site investigation of an air bag deployment collision that involved a 1990 Ford Mustang. The Mustang was traveling east in the center of a two-lane, undivided county roadway. The undercarriage of the case vehicle impacted a drainage ditch located on the northeast corner of a four-leg, offset-cross intersection causing the driver side supplemental restraint system (air bag) to deploy. The Mustang vaulted from the drainage ditch and rolled over. The case vehicle rotated both about its longitudinal and lateral axes, primarily in an end-over-end fashion, and came to rest on its wheels facing southwest. The driver was ejected through the sunroof and sustained fatal injuries which included: bilateral posterior rib fractures with massive hemothorax, lacerated aorta, lacerated left bronchus at the hilum, heart contusion, basilar skull fracture, fracture of the body of the sixth thoracic vertebra, fracture of the cornua of the thyroid cartilage, and fractured left femur.</p>					
17. Key Words Air Bag Motor Vehicle Traffic Accident Deployment Injury Severity			18. Distribution Statement General Public		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 67	22. Price

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## **DISCLAIMERS**

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**The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the National Highway Traffic Safety Administration.**

**The crash investigation process is an inexact science which requires that physical evidence such as skid marks, vehicular damage measurements, and occupant contact points be coupled with the investigator's expert knowledge and experience of vehicle dynamics and occupant kinematics in order to determine the pre-crash, crash, and post-crash movements of involved vehicles and occupants.**

**Because each crash is a unique sequence of events, generalized conclusions cannot be made concerning the crashworthiness performance of the involved vehicle(s) or their safety systems.**

# TRC/IU ON-SITE AIR BAG INVESTIGATION

TRC/IU CASE NO. 90-01

FLEET - PRIVATE VEHICLE  
LOCATION - [REDACTED] INDIANA

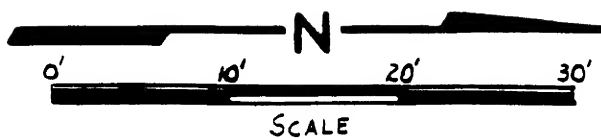
## Summary

This report concerns a motor vehicle accident involving an air bag equipped 1990 Ford Mustang occurring on [REDACTED] 20, 1990 at 3:49 a.m. near [REDACTED] Indiana on a County Road.

The Mustang was traveling east, while being pursued by the police, in the center of a two-lane, undivided roadway when it entered an offset-cross intersection and failed to negotiate the offset. The Mustang departed the road and impacted a drainage ditch located on the northeast quadrant of the intersection. The Mustang vaulted approximately 73 feet, while rolling approximately 90 degrees counterclockwise, and landed on its left side. The left front bumper corner of the Mustang dug into the ground, causing the vehicle to pitch forward approximately 90 degrees and "stand on its nose". The Mustang vaulted an additional 70 feet--rolling approximately 180 degrees counterclockwise, continuing to pitch forward approximately an additional 180 degrees, and "stand on its tail". The Mustang continued its rotations coming to rest almost 175 feet from the drainage ditch on its wheels pointing approximately southwest.

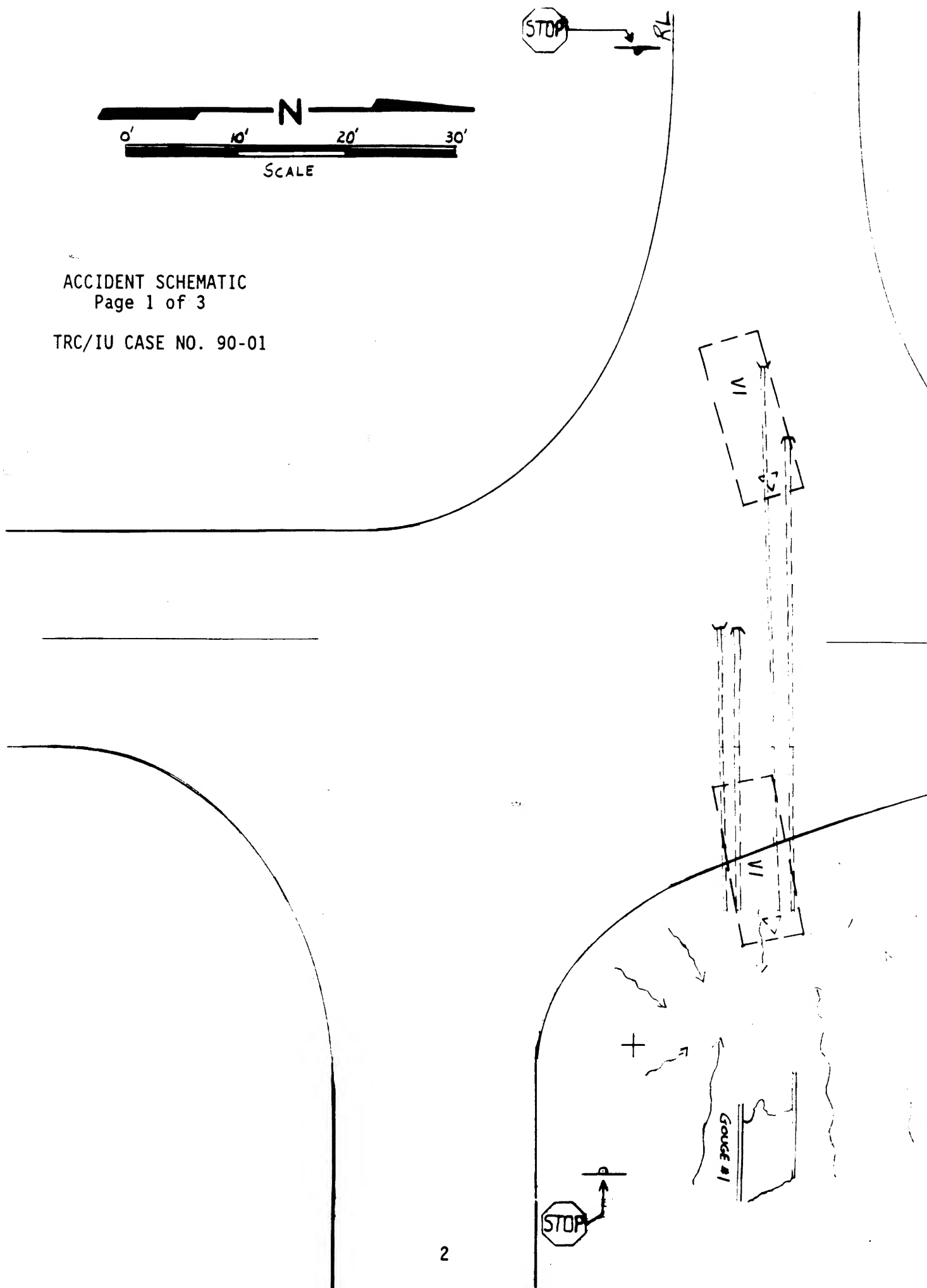
The front undercarriage of the Mustang impacted the drainage ditch. The CDC was determined to be: 00-UDDW-2 for the impact with the ditch. The CDC for the rollover was determined to be: 00-TDDO-2. No reconstruction program was used on this collision.

The 1990 Ford Mustang was equipped with a driver supplemental restraint system (air bag) which deployed as a result of the undercarriage impact. The driver of the vehicle (33 year-old male) was not wearing the available active three-point lap and shoulder belt. He was ejected through the sunroof and sustained fatal chest injuries. The driver of the Mustang was listed on the Police Accident Report as sustaining a "K" (fatal) injury.



ACCIDENT SCHEMATIC  
Page 1 of 3

TRC/IU CASE NO. 90-01





TRC/IU CASE NO. 90-01

— NORTH —>

⊙  
RP

RL

GOUGE #2

GOUGE #3

ACCIDENT SCHEMATIC  
Page 3 of 3

TRC/IU CASE NO. 90-01

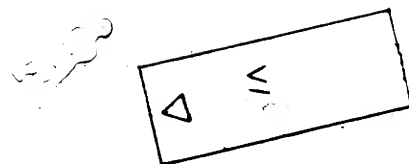
— NORTH —>



RL

Gouge # 4

Gouge # 5  
REAR WING  
PIECES  
BACKLITE  
GLASS



# TRC/IU ON-SITE AIR BAG INVESTIGATION

TRC/IU CASE NO. 90-01

FLEET - PRIVATE VEHICLE  
LOCATION - [REDACTED] INDIANA

## ACCIDENT DATA

Location/Street: County Roadway at its offset-cross intersection with another County Roadway

City/Township: [REDACTED] Indiana

Area/Type: Rural/Agricultural

Accident Date/Time: [REDACTED] 20, 1990 @ 3:49 a.m.

Investigating Police Agency: [REDACTED] County Sheriff Department

Accident Type: Car - ran-off-road

Occupant Injury Severity (air bag vehicle): Fatal - Lacerated Aorta (AIS-4)

## AMBIENT CONDITIONS

Light conditions: Dark

Weather Condition: Clear

Precipitation: None

Road Surface: Dry

## ROADWAY

### Case Vehicle

Location: County road

Number of Travel Lanes: 2-lanes, undivided

Width: 17.5 feet

Surface Type: Asphalt

Median: None

Shoulders: North edge - unimproved  
South edge - unimproved

**ROADWAY (CONT'D.)**

	<u>Case Vehicle</u>
Vertical alignment:	Level
Horizontal alignment:	Straight
Estimated Coefficient of Friction:	.65
Traffic Density:	Light

**TRAFFIC CONTROLS**

	<u>Case Vehicle</u>
Signals:	None
Signs:	Stop sign
Markings:	None
Speed Limit:	55 m.p.h.

**VEHICLES**

	<u>Case Vehicle</u>
Year:	1990
Make:	Ford
Model:	Mustang LX
Body Type:	2-door hatchback
V.I.N.:	1FACP41E6LF-----
Color:	Red
Mileage:	2,796
Engine:	8 cylinder, 5.0 liter
Transmission:	5-speed manual, console mounted
Steering:	Power-assisted rack-and-pinion
Brakes:	Power 4-wheel disc

**VEHICLES (CONT'D.)****Case Vehicle**

Padding: Padded instrument panel with smooth contours, soft-edged steering wheel rim and air bag module cover, soft sunvisor, door panels, door armrests, and adjustable head restraint.

Active Restraints: 3-point lap and shoulder belt in driver, right-front, left-rear, and right-rear positions

Passive Restraints: Factory installed driver supplemental restraint system (air bag).

Defects: None

Fleet: Private vehicle

Tow status: Towed due to damage

**VEHICLE DAMAGE****Exterior****Case Vehicle****Deployment Impact**

Event number: 1

Object Struck: Drainage ditch

Damage location

Damaged Plane:	Undercarriage
Vertical Location	
On Plane:	Not applicable
Direct Begins:	Not applicable
Length Direct:	Not applicable
Field L:	Not applicable
C1:	Not applicable
C2:	Not applicable
C3:	Not applicable
C4:	Not applicable
C5:	Not applicable
C6:	Not applicable
D:	Not applicable
Maximum Crush:	Masked by rollover damage to front plane
Location:	Undercarriage

CDC: 00-UDDW-2

Damaged Components: Front splashpan, left-front tire and wheel, left-front wheel well guard, left-front control arm, oil pan, dual exhaust system, bottom of rocker panels, dual mufflers, and gas tank.

**VEHICLE DAMAGE (CONT'D.)****Exterior (Cont'd.)****Case Vehicle****Nondeployment Impact**

Event number: 2

Object Struck: Ground

## Damage location

Damaged Plane: Top

## Vertical Location

On Plane: Not applicable

Length Direct: Not applicable

Direct Begins: Not applicable

Field L: Not applicable

C<sub>1</sub>: Not applicableC<sub>2</sub>: Not applicableC<sub>3</sub>: Not applicableC<sub>4</sub>: Not applicableC<sub>5</sub>: Not applicableC<sub>6</sub>: Not applicable

D: Not applicable

Maximum Crush: Less than 1.5 inch

Location: Roof (CDC protocol required)

Note: Projected plane of primary contact was to the top, but the majority of damage was on the hood and hatch area.

CDC: 00-TDD0-2

Damaged Components: Windshield; left-front door glass; left-rear window glass; backlight glass; hood; front bumper; front headlights; front grille; left-front: fender, door, outside mirror; sunroof (missing); hatchback; right-front fender; rear spoiler (missing); rear taillights; rear bumper, left-rear quarter panel.

**Interior**

Damaged Components: Left-side instrument panel, left lower knee bolster, back of driver's bucket seat.

Other Evidence of Occupant Contact: Left-front armrest, left-front window sill, left upper A-pillar, roof near left side of sunroof opening.

Manual Restraint System Failures: None

**VEHICLE DAMAGE (CONT'D.)****Interior (Cont'd.)****Case Vehicle**

Seat Performance  
Failures:

Driver's seat was rotated slightly  
counterclockwise from collision forces.

**Repair**

Cost Estimate:

This vehicle was considered a total loss.

**VEHICLE VELOCITY ESTIMATES****Highest Delta "V"****Case Vehicle**

Reconstruction Program:

None

Program Algorithm:

Not applicable

Travel Speed:

Unknown: high rate of speed with police in  
pursuit.

Total Delta "V":

Unknown

Longitudinal Delta "V":

Unknown

Lateral Delta "V":

Unknown

**COLLISION SEQUENCE**

Pre-Crash: The case vehicle (Mustang) was traveling east in the center of a two-lane, undivided county road and was attempting to elude a police car and continue in its direction of travel. The vehicle came upon an offset-cross intersection with a north-south county road. The driver of the case vehicle attempted to brake prior to entering the intersection. As a result, the case vehicle rotated in a counterclockwise yaw and continued through the intersection. The case vehicle exited the east road edge of the north-south county road, vaulting approximately fifteen feet, and impacted the drainage ditch located on the northeast quadrant of the intersection.

Crash: The front undercarriage of the case vehicle impacted the drainage ditch causing the driver side supplemental restraint system (air bag) to deploy. The case vehicle vaulted approximately 73 feet, while rolling approximately 90 degrees counterclockwise, and landed on its left side. The left front bumper corner of the Mustang dug into the ground, causing the vehicle to pitch forward approximately 90 degrees and "stand on its nose". The Mustang vaulted an additional 70 feet--rolling approximately 180 degrees counterclockwise, continuing to pitch forward approximately an additional 180 degrees, and "stand on its tail".

**COLLISION SEQUENCE (CONT'D.)**

The Mustang continued its rotations coming to rest almost 175 feet from the drainage ditch on its wheels pointing approximately southwest.

**Post-Crash:**

**Occupants:** The driver of the case vehicle was ejected through the sunroof and was found lying facedown near the right front bumper corner. The driver's head was closest to the corner and the body was angled at approximately 350 degrees relative to the front of the vehicle.

**Police:** The investigating police agency was in pursuit of the driver when the accident occurred and arrived on-scene within one minute. Traffic control procedures were established and emergency medical and towing services were called to assist.

**Rescue:** The driver was pronounced dead at the scene and was transported by ambulance to a medical facility where an autopsy was performed.

**Removal:** Following the police investigation, the case vehicle was towed from the scene.

**HUMAN FACTORS/OCCUPANT DATA**

	<u>Case Vehicle</u>
Driver:	33 year-old male
Height:	75 inches
Weight:	180 pounds
Occupation:	Carpet layer
Active Restraint System/Usage:	3-point lap and shoulder/not used
Usage Source:	Police and vehicle inspection
Eye glasses/contacts:	Unknown
Vehicle Familiarity:	Less than 3,000 miles
Route Familiarity:	Unknown
Trip Plan:	Unknown



HUMAN FACTORS/OCCUPANT DATA (CONT'D.)Case Vehicle

Manner of Leaving Scene: Ambulance  
 Type of Medical Treatment: None - Dead at scene

DRIVER INJURIES

<u>Injury</u>	<u>Severity (OIC/AIS)</u>	<u>Source</u>
		Unknown exterior surface of driver's vehicle
Laceration of aorta	CCLA-4	
Contusion base of heart	CCCH-3	
Laceratio left bronchus at hilum	CCLR-3	
Fracture T <sub>1</sub>	BSFS-2	
Bilateral posterior rib fractures with massive hemothorax	CBFS-4	
Fracture right clavicle at manubrium	SRFS-2	
Dislocation right sterno-clavicular joint	SRDJ-2	
Fracture cornua of thyroid cartilage	NAFR-3	
Contusion left sterno-cleidomastoid muscle	NLCM-1	
Contusion right sterno-cleidomastoid muscle	NRCM-1	
Contusion chest wall	CUCI-1	
		Roof near sunroof
Fracture of skull in left posterior cranial fossa	HIFS-3	
Fracture body of T <sub>6</sub>	BSFS-3	
		Left side window frame, side rail, or A-pillar
Fracture left temporal bone	HLFS-2	
Laceration left face	FLLI-1	
Fracture left distal clavicle	SLFS-2	Driver's door surface
Multiple linear abrasions anterior surface of body	OAAI-1	Ground
Fracture left femur	TLFS-3	Unknown

### DRIVER KINEMATICS

The driver of the case vehicle was in an unknown posture, but probably was near normally oriented behind the steering wheel. The driver was braking and may have been trying to steer.

The air bag system deployed as a result of the frontal undercarriage impact. The driver moved forward and impacted the deployed air bag probably with his face and chest. The driver's left knee contacted the left instrument panel and knee bolster.

After the vehicle vaulted from its undercarriage impact, the vehicle rolled approximately 90 degrees counterclockwise and dug into the ground with its left-front fender. The driver's air bag had deflated by this time rendering it of no additional use. The driver contacted: (1) the left side door surface and armrest, (2) left roof rail and A-pillar, and (3) probably the windshield. After digging into the ground the vehicle pitched forward 90 degrees "standing-on-its-nose". This action further forced the driver towards the left A-pillar area.

As the vehicle continued to rotate: (1) pitching forward an additional 180 degrees and (2) rolling an additional 180 degrees counterclockwise, it struck the ground "standing-on-its-tail". This impact caused the rear spoiler to bury into the ground and the backlight to disintegrate. At or somewhere prior to this point, the sunroof came open. The driver moved toward the roof and is believed to have been ejected at or near this time.

The vehicle continued to roll and pitch coming to rest facing southwest with the driver lying facedown on the ground. During this final rotation an unidentified exterior surface of the case vehicle struck the driver causing several injuries which resulted in his death.

### AIR BAG SYSTEM

The driver side air bag deployed as designed. Even though the impact was to the frontal undercarriage, there was still sufficient longitudinal deceleration to cause the air bag to deploy. Thus, the air bag performed as designed in absorbing the initial longitudinal forces to the driver. Although the driver was killed because of the ejection, had the driver also been restrained with the available three-point lap and shoulder belt system, it is likely that this driver would have survived the accident with significantly reduced life-threatening injuries.

No generant residue was noted in the vehicle.

**SELECTED PRINTS**



# 01 -- 1990  
Indiana  
TRC/IU: 90-01, Task: 0068  
Mustang frontal view



# 02 -- 1990  
Indiana  
TRC/IU: 90-01, Task: 0068  
Across front from left side





# 03 - 1990  
Indiana  
TRC/IU: 90-01, Task: 0068  
Full left side view



# 04 - 1990  
Indiana  
TRC/IU: 90-01, Task: 0068  
Across rear from left side



# 05 -- 1990  
Indiana  
TRC/IU: 90-01, Task: 0068  
Left rear rearside view



# 06 -- , 1990  
Indiana  
TRC/IU: 90-01, Task: 0068  
Damaged rear plane





# 07 , 1990  
Indiana  
TRC/IU: 90-01, Task: 0068  
Right rear rearside view



# 08 - 1990  
Indiana  
TRC/IU: 90-01, Task: 0068  
Full right side view

**SLIDE INDEX**



## SLIDE INDEX

Slide No.	Description	Direction
1	Reverse view of approach, approximately 300 feet west of intersection	West
2-5	Approach views, approximately 300 feet, 250 feet, 100 feet, and 50 feet, respectively, west of intersection. Note: Crash occurred at 0349 hours with light condition being "dark, no lights".	East
6-9	Views of reconstruction "I" jig placed on vehicle's brake marks. In slides 5 & 6, jig is at beginning of LR marks. Note slight CCW yaw of vehicle as it crossed the intersection and entered the NE quadrant turn-apron and grass.	East
10	Vehicle at touchdown area #1. Vehicle vaulted across NE quadrant drainage ditch for approximately 15 feet.	East
11	Farm field gouging from vehicle at touchdown area #2. Vehicle vaulted approximately 73 feet from touchdown area #1 to area #2.	East
12-13	Reverse views of touchdown area #2	West
14-15	Views of touchdown area #5. Vehicle's LR corner struck ground first, with top of vehicle facing the ground and the undercarriage facing up. Glass on ground is from backlight.	East
16-17	Views of vehicle's rear spoiler. Note embedded LR spoiler corner. (Note: Investigating officer brought pieces to scene inspection.)	East
18	View of vehicle's right-half of rear spoiler	East
19	Reverse view of touchdown area #5	West
20	View of vehicle's final rest position	East
21	View of vehicle's final rest, looking rear-to-front of vehicle	South
22	Reverse view of vehicle's final rest position	West

**SLIDE INDEX (Cont'd.)**

<b>Slide No.</b>	<b>Description</b>	<b>Direction</b>
23	View of vehicle's final rest position, plus driver's final rest position. The red-painted brackets forward of vehicle's RF corner indicate FRP of the head, with the body lying NW-SE, head-to-toe.	Northeast
24-46	Exterior damage views of vehicle	
25	Note nonhorizontal impact to LF wheel well area, downward deflection to front, and debris/dirt in LF forward door seam and LF A-pillar.	
26	Close-up of deflated LF tire	
30	Close-up of LF headlamp assembly	
31	Close-up of RF headlamp assembly	
35	Close-up of RF tire	
36	Close-up of RR tire	
37-46	Note nonhorizontal impact to hatchback, missing backlight glass, and missing rear spoiler.	
45	Close-up of LR tire	
47-52	Aerial views of vehicle's exterior damage	
47	Frontal view	
48-49	Right-side view; note missing sunroof	
50	Rear view	
51-52	Left-side view	
53	Exterior view of windshield contact	
54	View of LR hatchback hinge	
55	View of RR hatchback hinge	
56	View of LR energy-absorbing bumper shaft; note stroke scratching	
57	Forward view of vehicle's rear spoiler	
58	Rear view of vehicle's rear spoiler	
59-65	Views of vehicle's sunroof	

## SLIDE INDEX (Cont'd.)

Slide No.	Description	Direction
63	View of sunroof rear locking device	
64	View of sunroof LF bracket	
65	View of sunroof RF bracket	
66-70	Undercarriage views of vehicle	
66	Note frontal debris	
71-78	Interior views of vehicle	
72	Note occupant windshield contact, as well as lower LF door panel.	
75	Note sunroof edge and upper LF door panel occupant contact points.	
76	Close-up of left-side sunroof edge occupant contact	
77-78	Views of deployed air bag	
79	Note exterior scratching to left of silver bracket.	
80	Note unused driver manual belt.	



IN 9001 #1



IN9001 #2



IN9001 #3



IN9001 #4



IN 9001 #5





IN 9001 #6



IN 8001 #7



IN 9001 #8



IN 9001 #9



IN 9001 #10



IN 9001 #11



IN9001 #12



IN9001 #13





IN 9001 #14



IN 9001 #15



IN 9001 #16



IN9001 #17



IN 9001 #18



IN 9001 #19



IN 9001 #20



IN 9001 #21





IN 9001 #22



IN 9001 #23



IN 9001 #24



IN 9001 #25



IN 9001 #26



IN9001 #27



IN 9001 #28



IN 9001 #29





IN 9001 #30



IN9001 #31



IN 9001 #32



IN 9001 #33



IN 9001 #34



IN 9001 #35



IN 9001 #36



IN 9001 #37





IN9001 #38



IN 9001 #39



IN 9001 840



IN 9001 #41



IN9001 #42



IN 9001 #43



IN 9001 #44



IN 9001 #45





IN 9001 #46



IN 9001 #47



IN 9001 #48



IN 9001 #49



IN 9001 #50



IN9001 #51

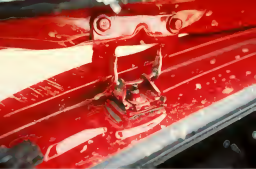


IN 9001 #52



IN 9001 #53





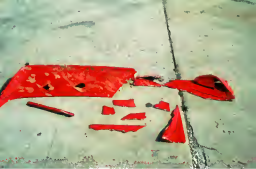
IN 9001 #54



IN 9001 #55



IN 9001 856



IN 9001 #57



IN 9001 #58



IN 9001 #59



IN9001 #60



IN 9001 #61





IN9001 #62



IN 9001 #63



IN 9001 #64



IN9001 #65



IN 9001 #66



IN 9001 #67



IN 9001 #68



IN 9001 #69





IN 9001 #70



IN 9001 #71  
Best Available



**IN9001 #72**  
**Best Available**



IN9001 #73  
Best Available



IN9001 #74



IN 9001 #75  
Best Available



IN 9001 #78  
Best Available



IN 9001 #77





IN 9001 #78



IN 9001 #79



IN 9001 #80

**NASS Accident Collision Measurement Table**



U.S. Department of Transportation  
National Highway Traffic Safety  
Administration

## ACCIDENT COLLISION MEASUREMENT TABLE

NATIONAL ACCIDENT SAMPLING SYSTEM  
CRASHWORTHINESS DATA SYSTEM

Primary Sampling Unit Number 10

Case Number - Stratum 9001

ACCIDENT COLLISION DIAGRAM		CRASH DATA		
LEVEL I PHYSICAL EVIDENCE ABSENT	LEVEL II (Cont'd) accomplished when physical evidence is present:	VEH. #1	VEH. #2	VEH. #3
To be accomplished when there is no physical evidence present at the scene:	*document reference point and reference line relative to physical features present at the scene	Heading Angle	_____	_____
*approximate vehicle orientation at impact and final rest	*scaled documentation of all accident induced physical evidence	Surface Type	_____	_____
*applicable road/roadway delineation (e.g., curbs/edge lines, lane markings, median markings, pavement markings, etc.)	*scaled documentation of all roadside objects contacted	Surface Condition	_____	_____
*applicable traffic controls (e.g., speed limit)	*roadway surface type and condition of applicable roadway	Grade Measurement (v/h)	_____	_____
*north arrow placed on diagram	*grade measurements for all applicable roadways			
*sketch required	*scaled representations of the vehicle(s) at pre-impact, impact, and final rest based upon either:			
	a) physical evidence, or			
	b) reconstructed accident dynamics			
LEVEL II PHYSICAL EVIDENCE PRESENT				
In addition to the Level I tests noted above, the following must be				

Reference Point: UTILITY POLE ON NE QUADRANT OF INTERSECTION

Reference Line: NORTH ROAD EDGE OF C.R. [REDACTED] EAST LEG

Item	Distance and Direction from Reference Point	Distance and Direction from Reference Line
RP - UTILITY POLE	X	6.7' N
FRP LF	151.9 E	26.5 N
FRP LR	150.6 E	33.4 N
DRIVER BODY MASS (CENTER)	146.7 E	17.9 N
FRP RF	146.4 E	24.7 N
DRIVER'S HEAD	145.1 E	19.6 N
FRP RR	144.8 E	32.8 N
END BACKLITE GLASS DEPOSIT	121.1 E	22.2 TO 25.2 N
RR DIVET	119.4 E	26.1
LR DIVET	113.6 E	26.9 N
BEGIN BACKLITE GLASS DEPOSIT	112.0 E	22.2 TO 25.2 N
BEGIN GOOGLE #5 / END GOOGLE #5	109.4 E / 121.2 E	27.6 N / 30.0 N

Item	Distance and Direction from Reference Point	Distance and Direction from Reference Line
END GOUGE #4 / BEGIN GOUGE #4	84.1 E / 80.4 E	19.9 N / 20.4 N
END GOUGE #3 / BEGIN GOUGE #3	77.3 E / 57.1 E	18.9 N / 20.1 N
DEEPEST PART OF GOUGE #3 END / BEG	64.5 E / 60.1 E	19.4 N / 19.4 N
END GOUGE #2 / BEGIN GOUGE #2	52.3 E / 40.3 E	21.6 N / 22.2 N
RF CORNER OF GOUGE #1	32.0 W	18.5 N
LF CORNER OF GOUGE #1	34.3 W	23.5 N
RR CORNER OF GOUGE #1	41.1 W	18.6 N
LR CORNER OF GOUGE #1	43.7 W	23.5 N
STOP SIGN (NE QUAD)	35.1 W	6.2 N
ROAD SIGN (NE QUAD)	46.6 W	8.9 N
END LF V-1	58.9 W	23.4 N
END LR V-1	58.9 W	22.1 N
END RF V-1	58.9 W	18.4 N
END RR V-1	58.9 W	17.3 N
EAST ROAD SIDE (CR 600E)	73.8 W	X
BEGIN RF V-1	84.6 W	18.2 N
BEGIN RR V-1	84.6 W	16.6 N
WEST ROAD SIDE (CR 600E)	93.4 W	X
BEGIN LF V-1	102.1 W	22.8 N
BEGIN LR V-1	108.6 W	20.5 N
STOP SIGN (SW QUAD, WEST NEE)	137.4 W	5.7 N
ROAD WIDTH (CR 100N)	137.4 W	8.9 N TO 26.4 N
CENTERLINE (CR 600E)	83.3 W	X

**Appendix A:**

**Police Accident Report**

## State Form 23558R2/Stock 302


Mail to: Indiana State Police, Accident Records Section  
[REDACTED] IN

Accident ID No

Date of Accident MAY 1990		Day of Week THURSDAY		Actual Local Time 11:00 AM		No Motor Vehicles 1		No Injured 1		No Dead 1		No Trailers 1																															
County CR				Township CR				City/Town or Nearest City/Town CR																																			
Inside Corporate Limits?		Property?		Distance and Direction From Corporate Limits		CENTER OF COUNTY																																					
Yes		No		DNR		Other		Miles North		Miles South		Miles East		Miles West																													
Road Accident Occurred On				Intersection Road Mile Marker Interchange																																							
CR				CR																																							
If not at intersection, number of feet from				Direction				Nearest intersecting Road/Mile Marker/Interchange																																			
Driver's Name (Last, First, MI)														Driver's Name (Last, First, MI)																													
Address (Street, City, State, Zip)														Address (Street, City, State, Zip)																													
Apparent Phys. Stat (enter no)														Sex		Date of Birth		YEAR		Arrested?		Apparent Phys. Stat (enter no)		Sex		Date of Birth		YEAR		Arrested?													
2														M		33		33		Yes		2		M		33		33		Yes													
Driver's License No														Lic Type		Lic St		Restr		Driver's License No		Lic Type		Lic St		Restr																	
CH														IN						CH		IN																					
Color				Veh Yr		Make		Model Name						Color				Veh Yr		Make		Model Name																					
RED				90		FORD		MUSTANG										90		FORD																							
Veh Type (enter no)				Lic Yr		License No		Lic State						Veh Type (enter no)				Lic Yr		License No		Lic State																					
1				90				IN						1				90				IN																					
Veh Use (enter no)				Speed Limit		Fuel Tax No								Veh Use (enter no)				Speed Limit		Fuel Tax No																							
1				55										1				55																									
Direction of Travel				No Occupants		Fire?		No Axles		Transporting Hazardous Mat		Direction of Travel						No Occupants		Fire?		No Axles		Transporting Hazardous Mat																			
E				1		Yes		2		Yes		E						1		Yes		2		Yes																			
Towed To				Towed By								Towed To				Towed By																											
Registered Owner's Name (Last, First, MI)														Registered Owner's Name (Last, First, MI)																													
Address (Street, City, State, Zip)														Address (Street, City, State, Zip)																													
IN																																											
Registered Owner's Name (Last, First, MI)														Registered Owner's Name (Last, First, MI)																													
Address (Street, City, State, Zip)														Address (Street, City, State, Zip)																													
IN																																											
License No														Make		Year		Lic St		Lic Yr		License No														Make		Year		Lic St		Lic Yr	
INITIAL IMPACT		Areas Damaged (Multiples)		Undercarriage		Trailer		None		Other Property (INCLUDE CARGO)		Name of Object		OWNER'S NAME AND ADDRESS		Damage Est (use chart)		Direction		Street/Highway		Arrested?		Apparent Phys Stat (enter no)																			
V1		V2		10		11		12		13		14		15		16		17		18		19		20																			
DAMAGE EST		V1		V2		10		11		12		13		14		15		16		17		18		19																			
4		1		2		3		4		5		6		7		8		9		10		11		12																			
10		1		2		3		4		5		6		7		8		9		10		11		12																			
10		1		2		3		4		5		6		7		8		9		10		11		12																			
10		1		2		3		4		5		6		7		8		9		10		11		12																			
10		1		2		3		4		5		6		7		8		9		10		11		12																			
10		1		2		3		4		5		6		7		8		9		10		11		12																			
10		1		2		3		4		5		6		7		8		9		10		11		12																			
10		1		2		3		4		5		6		7		8		9		10		11		12																			
10		1		2		3		4		5		6		7		8		9		10		11		12																			
10		1		2		3		4		5		6		7		8		9		10		11		12																			
10		1		2		3		4		5		6		7		8		9		10		11		12																			
10		1		2		3		4		5		6		7		8		9		10		11		12																			
10		1																																									



Diagram

  
 Indicate NORTH  
by an arrow

SEE ATTACHED

## NARRATIVE (Refer to Vehicle by Number)

VI WAS BEING PURSUED BY POLICE ON CR [REDACTED] EAST BOUND. AS VI WENT THROUGH INTERSECTION AT CR [REDACTED] IT LEFT ROADWAY AND ROLLED END OVER END EJECTING AND KILLING DRIVER OF VI.

D1 Insured By

D2 Insured By

Other Participant(s) Name, Address (etc.)

Name of Witness No. 1

Address

Location at Time of Accident

Name of Witness No. 2

Address

Location at Time of Accident

Name of Person Arrested

I.C. Code(s)

Name of Person Arrested

I.C. Code(s)

Time Notified

☒ AM

Time Arrived

☒ AM

3:49

PM

3:50

PM

Assisting Officer

I.D. No.

Investigation Complete

☐ Yes☒ No

Photos Taken

☒ Yes☐ No

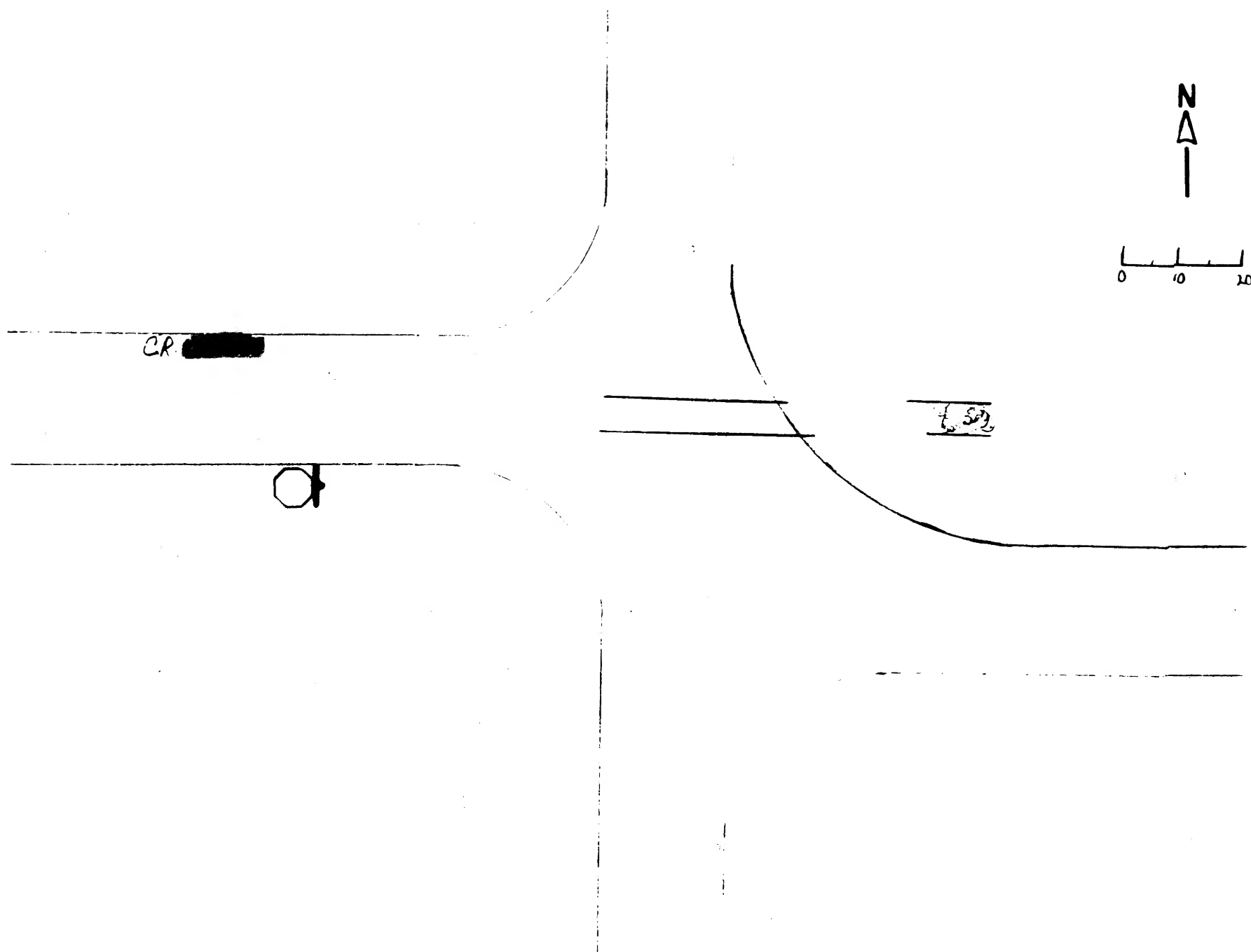
Date of Report

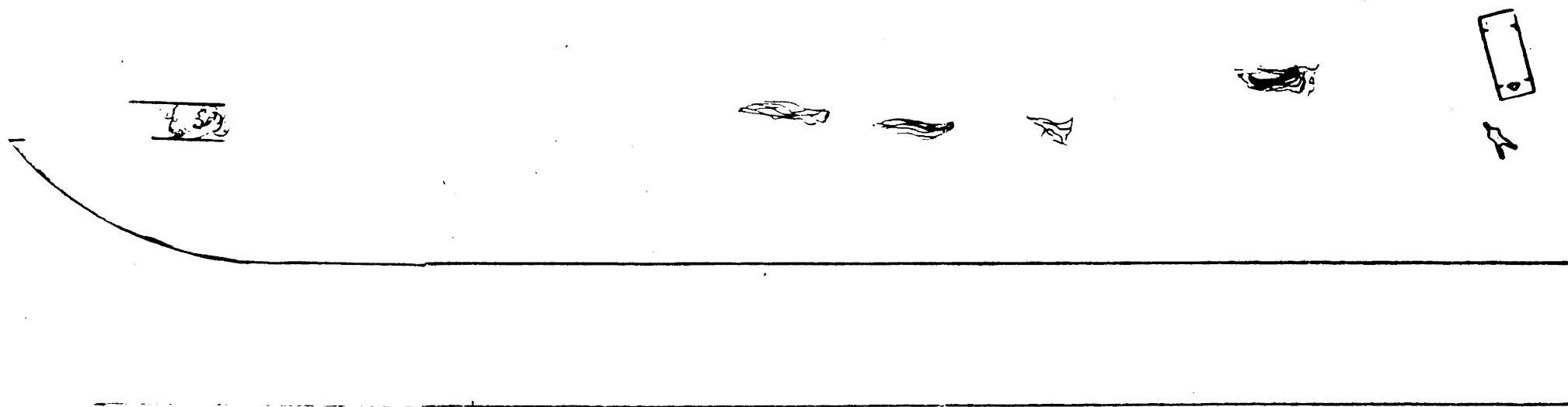
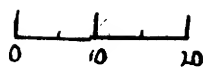
[REDACTED] 90

Driver Report

Form Furnished

☐ D1☐ D2





**Appendix B:**

NASS Accident Form



US Department of Transportation  
National Highway Traffic Safety  
Administration

## ACCIDENT FORM

NATIONAL ACCIDENT SAMPLING SYSTEM  
CRASHWORTHINESS DATA SYSTEM

<p>1. Primary Sampling Unit Number <u>10</u></p> <p>2. Case Number - Stratum <u>9001</u></p>	<p style="text-align: center;"><b>SPECIAL STUDIES INDICATORS</b></p> <p>Check (✓) each special study (SS12-SS16 below) that has been completed; code 1 for the checked special studies and 0 for the special studies not checked.</p> <p>6. <u>  </u> SS12 Not Active <u>0</u></p> <p>7. <u>  </u> SS13 AOPS <u>0</u></p> <p>8. <u>  </u> SS14 <u>                    </u> <u>0</u></p> <p>9. <u>  </u> SS15 <u>                    </u> <u>0</u></p> <p>10. <u>  </u> SS16 <u>                    </u> <u>0</u></p>																																										
<b>IDENTIFICATION</b>																																											
<p>3. Number of General Vehicle Forms Submitted <u>01</u></p> <p>4. Date of Accident (Month, Day, Year) <u>          </u> / <u>9</u> / <u>0</u></p> <p>5. Time of Accident <u>          </u></p> <p>Code reported military time of accident.</p> <p>NOTE: Midnight - 2400 Unknown - 9999</p>	<p style="text-align: center;"><b>NUMBER OF EVENTS</b></p> <p>11. Number of Recorded Events in This Accident <u>02</u></p> <p>Code the number of events which occurred in this accident.</p>																																										
<b>ACCIDENT EVENTS</b>																																											
<p>For each event that occurred in the accident, code the lowest numbered vehicle in the left columns and the other involved vehicle or object on the right.</p>																																											
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 12.5%;">Accident Event Sequence Number</th> <th style="width: 12.5%;">Vehicle Number</th> <th style="width: 12.5%;">Class of Vehicle</th> <th style="width: 12.5%;">General Area of Damage</th> <th style="width: 12.5%;">Vehicle Number or Object Contacted</th> <th style="width: 12.5%;">Class of Vehicle</th> <th style="width: 12.5%;">General Area of Damage</th> </tr> </thead> <tbody> <tr> <td>12. <u>01</u></td> <td>13. <u>01</u></td> <td>14. <u>02</u></td> <td>15. <u>U</u></td> <td>16. <u>60</u></td> <td>17. <u>00</u></td> <td>18. <u>C</u></td> </tr> <tr> <td>19. <u>02</u></td> <td>20. <u>01</u></td> <td>21. <u>02</u></td> <td>22. <u>T</u></td> <td>23. <u>61</u></td> <td>24. <u>00</u></td> <td>25. <u>N</u></td> </tr> <tr> <td>26. <u>03</u></td> <td>27. <u>      </u></td> <td>28. <u>      </u></td> <td>29. <u>      </u></td> <td>30. <u>      </u></td> <td>31. <u>      </u></td> <td>32. <u>      </u></td> </tr> <tr> <td>33. <u>04</u></td> <td>34. <u>      </u></td> <td>35. <u>      </u></td> <td>36. <u>      </u></td> <td>37. <u>      </u></td> <td>38. <u>      </u></td> <td>39. <u>      </u></td> </tr> <tr> <td>40. <u>05</u></td> <td>41. <u>      </u></td> <td>42. <u>      </u></td> <td>43. <u>      </u></td> <td>44. <u>      </u></td> <td>45. <u>      </u></td> <td>46. <u>      </u></td> </tr> </tbody> </table>	Accident Event Sequence Number	Vehicle Number	Class of Vehicle	General Area of Damage	Vehicle Number or Object Contacted	Class of Vehicle	General Area of Damage	12. <u>01</u>	13. <u>01</u>	14. <u>02</u>	15. <u>U</u>	16. <u>60</u>	17. <u>00</u>	18. <u>C</u>	19. <u>02</u>	20. <u>01</u>	21. <u>02</u>	22. <u>T</u>	23. <u>61</u>	24. <u>00</u>	25. <u>N</u>	26. <u>03</u>	27. <u>      </u>	28. <u>      </u>	29. <u>      </u>	30. <u>      </u>	31. <u>      </u>	32. <u>      </u>	33. <u>04</u>	34. <u>      </u>	35. <u>      </u>	36. <u>      </u>	37. <u>      </u>	38. <u>      </u>	39. <u>      </u>	40. <u>05</u>	41. <u>      </u>	42. <u>      </u>	43. <u>      </u>	44. <u>      </u>	45. <u>      </u>	46. <u>      </u>	
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<p>IF GREATER THAN FIVE EVENTS, CONTINUE CODING ON THE ACCIDENT EVENTS SUPPLEMENT</p>																																											

**Appendix C:**

**NASS Vehicle Forms**



National Highway Traffic Safety  
Administration

# GENERAL VEHICLE FORM

NATIONAL ACCIDENT SAMPLING SYSTEM  
CRASHWORTHINESS DATA SYSTEM

<p>1. Primary Sampling Unit Number <u>10</u></p> <p>2. Case Number - Stratum <u>9001</u></p> <p>3. Vehicle Number <u>01</u></p>	<p>11. Police Reported Alcohol or Drug Presence <u>1</u></p> <p>(0) Neither alcohol nor drugs present (1) Yes (alcohol present) (2) Yes (drugs present) (3) Yes (alcohol and drugs present) (4) Yes (alcohol or drugs present - specifics unknown) (7) Not reported (8) No driver present (9) Unknown</p>
<b>VEHICLE IDENTIFICATION</b>	
<p>4. Vehicle Model Year <u>90</u> Code the last two digits of the model year (99) Unknown</p> <p>5. Vehicle Make (specify): <u>12</u> <u>FORD</u> Applicable codes are found in your NASS CDS Data Collection, Coding, and Editing Manual. (99) Unknown</p> <p>6. Vehicle Model (specify): <u>003</u> <u>MUSTANG</u> Applicable codes are found in your NASS CDS Data Collection, Coding, and Editing Manual. (999) Unknown</p> <p>7. Body Type <u>03</u> Note: Applicable codes are found on the back of this page.</p> <p>8. Vehicle Identification Number <u>1EACD41E6LF</u> Left justify: Slash zeros and letter Z (0 and Z) No VIN - Code all zeros Unknown - Code all nine's</p>	<p>12. Alcohol Test Result for Driver <u>0x</u> Code actual value (decimal implied before first digit - 0.xx) (95) Test refused (96) None given (97) AC test performed, results unknown (98) No driver present (99) Unknown</p> <p>Source <u>[REDACTED]</u></p>
<b>ACCIDENT RELATED</b>	
<p>9. Police Reported Vehicle Disposition <u>1</u> (0) Not towed due to vehicle damage (1) Towed due to vehicle damage (9) Unknown</p> <p>10. Police Reported Travel Speed <u>77</u> Code to the nearest mph (NOTE: 00 means less than 0.5 mph) (97) 96.5 mph and above (99) Unknown</p>	<p>13. Speed Limit <u>55</u> (00) No statutory limit Code posted or statutory speed limit (99) Unknown</p> <p>14. Attempted Avoidance Maneuver <u>99</u> (00) No impact (01) No avoidance actions (02) Braking (no lockup) (03) Braking (lockup) (04) Braking (lockup unknown) (05) Releasing brakes (06) Steering left (07) Steering right (08) Braking and steering left (09) Braking and steering right (10) Accelerating (11) Accelerating and steering left (12) Accelerating and steering right (97) No driver present (98) Other action (specify): _____ (99) Unknown</p> <p>15. Accident Type <u>1</u> Applicable codes may be found on the back of page two of this field form (00) No impact Code the number of the diagram that best describes the accident circumstance (98) Other accident type (specify): _____ (99) Unknown</p>
<b>OFFICIAL RECORDS</b>	

\*\*\*\* STOP HERE IF GV07 DOES NOT EQUAL 01-49 \*\*\*\*

**OCCUPANT RELATED**16. Driver Presence in Vehicle 1

- (0) Driver not present  
(1) Driver present  
(9) Unknown

17. Number of Occupants This Vehicle 01

- (00-96) Code actual number of occupants  
for this vehicle  
(97) 97 or more  
(99) Unknown

18. Number of Occupant Forms Submitted 0124. Rollover 4

- (0) No rollover (no overturning)

Rollover (primarily about the longitudinal axis)

- (1) Rollover, 1 quarter turn only  
(2) Rollover, 2 quarter turns  
(3) Rollover, 3 quarter turns  
(4) Rollover, 4 or more quarter turns (specify):  
\_\_\_\_\_

- (5) Rollover – end-over-end (i.e., primarily  
about the lateral axis)

- (9) Rollover (overturn), details unknown

**VEHICLE WEIGHT ITEMS**19. Vehicle Curb Weight 02,200

~~2759~~ Code weight to nearest  
100 pounds.

- (010) Less than 1050 pounds  
(135) 13,500 lbs or more  
(999) Unknown

Source: \_\_\_\_\_

20. Vehicle Cargo Weight 000

C Code weight to nearest  
100 pounds.

- (00) Less than 50 pounds  
(97) 9,650 lbs or more  
(99) Unknown

**OVERRIDE/UNDERRIDE (THIS VEHICLE)**25. Front Override/Underride (this vehicle) 026. Rear Override/Underride (this vehicle) 0

- (0) No override/underride, or  
not an end-to-end impact

Override (see specific CDC)

- (1) 1st CDC  
(2) 2nd CDC  
(3) Other not automated CDC (specify):  
\_\_\_\_\_

Underride (see specific CDC)

- (4) 1st CDC  
(5) 2nd CDC  
(6) Other not automated CDC (specify):  
\_\_\_\_\_

- (7) Medium/heavy truck override  
(9) Unknown

**RECONSTRUCTION DATA**21. Towed Trailing Unit 0

- (0) No towed unit  
(1) Yes – towed trailing unit  
(9) Unknown

22. Documentation of Trajectory Data  
for This Vehicle 1

- (0) No  
(1) Yes

23. Post Collision Condition of Tree or Pole  
(for Highest Delta V) 0

- (0) Not collision (for highest delta V) with  
tree or pole  
(1) Not damaged  
(2) Cracked/sheared  
(3) Tilted < 45 degrees  
(4) Tilted > 45 degrees  
(5) Uprooted tree  
(6) Separated pole from base  
(7) Pole replaced  
(8) Other (specify):  
\_\_\_\_\_

- (9) Unknown

**HEADING ANGLE AT IMPACT FOR  
HIGHEST DELTA V**

Values: (000)-(359) Code actual value  
(997) Noncollision  
(998) Impact with object  
(999) Unknown

27. Heading Angle for This Vehicle 99728. Heading Angle for Other Vehicle 997



## National Accident Sampling System – Crashworthiness Data System: General Vehicle Form

Page 3

29. Basis for Total Delta V (Highest) 5

## Delta V Calculated

- (1) CRASH program – damage only routine
- (2) CRASH program – damage and trajectory routine
- (3) Missing vehicle algorithm

## Delta V Not Calculated

- (4) At least one vehicle (which may be this vehicle) is beyond the scope of an acceptable reconstruction program, regardless of collision conditions.
- (5) All vehicles within scope (CDC applicable) of CRASH program but one of the collision conditions is beyond the scope of the CRASH program or other acceptable reconstruction techniques, regardless of adequacy of damage data.
- (6) All vehicles and collision conditions are within scope of one of the acceptable reconstruction programs, but there is insufficient data available.

**COMPUTER GENERATED DELTA V**

## 30. Total Delta V

Secondary Highest

99

\_\_\_\_ Nearest mph \_\_\_\_

(NOTE: 00 means less than  
- 0.5 mph)  
(97) 96.5 mph and above  
(99) Unknown

## 31. Longitudinal Component of Delta V

+ 99

\_\_\_\_ Nearest mph \_\_\_\_

(NOTE: 00 means greater than  
- 0.5 and less than - 0.5 mph)  
(- 97) - 96.5 mph and above  
(- 99) Unknown

Secondary Highest

## 32. Lateral Component of Delta V

+ 99

\_\_\_\_ Nearest mph \_\_\_\_

(NOTE: 00 means greater than  
- 0.5 and less than + 0.5 mph)  
(± 97) ± 96.5 mph and above  
(- 99) Unknown

## 33. Energy Absorption

999900

\_\_\_\_ Nearest 100 foot-lbs \_\_\_\_

(NOTE: 0000 means less than 50 Foot-Lbs)  
(9997) 999,650 foot-lbs or more  
(9999) Unknown

## 34. Confidence in Reconstruction Program Results (for Highest Delta V)

- (0) No reconstruction
- (1) Collision fits model – results appear reasonable
- (2) Collision fits model – results appear high
- (3) Collision fits model – results appear low
- (4) Borderline reconstruction – results appear reasonable

## 35. Type of Vehicle Inspection

- (0) No Inspection
- (1) Complete inspection
- (2) Partial inspection (specify):

## 36. Is this an AOPS Vehicle?

- (0) No
- (1) Yes

\*\*\* STOP: IF THE CDS APPLICABLE VEHICLE WAS NOT INSPECTED (I.E., GV35 = 0). \*\*\*  
DO NOT COMPLETE THE EXTERIOR AND INTERIOR VEHICLE FORMS.

## EXTERIOR VEHICLE FORM

**NATIONAL ACCIDENT SAMPLING SYSTEM  
CRASHWORTHINESS DATA SYSTEM**

1. Primary Sampling Unit Number	<u>10</u>	3. Vehicle Number	<u>01</u>
2. Case Number - Stratum	<u>9001</u>		

VIN 1FACP41E6LF Model Year 1990  
Vehicle Make (specify): FORD Vehicle Model (specify): MUSTANG

Locate the end of the damage with respect to the vehicle longitudinal center line or bumper corner for end impacts or an undamaged axle for side impacts.

Specific Impact No.	Location of Direct Damage	Location of Field L	Location of Maximum Crush
1	UNDERCARRIAGE	DAMAGE MASKED BY SPECIFIC IMPACT # 2	
2	FRONT	FRONT BUMPER	C <sub>1</sub>
3	REAR	REAR BUMPER	C <sub>1</sub>

NOTES: Identify the plane at which the C-measurements are taken (e.g., at bumper, above bumper, at sill, above sill, etc.) and label adjustments (e.g., free space).

**Measure C1 to C6 from driver to passenger side in front or rear impacts and rear to front in side impacts.**

Free space value is defined as the distance between the baseline and the original body contour taken at the individual C locations. This may include the following: bumper lead, bumper taper, side protrusion, side taper, etc. Record the value for each C-measurement and maximum crush.

Use as many lines/columns as necessary to describe each damage profile.

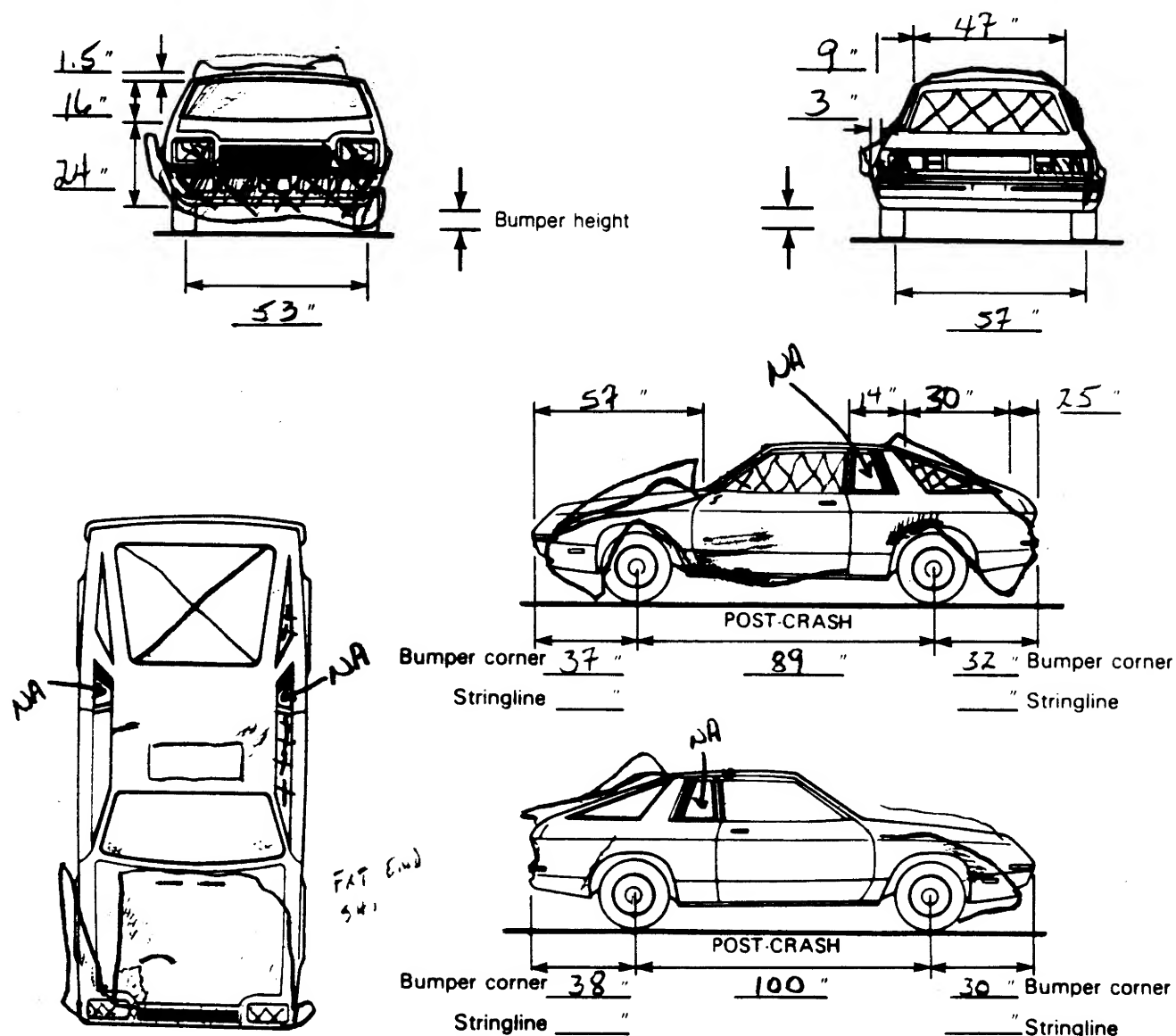
Specific Impact Number	Plane of C-Measurements	Direct Damage		Field L	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>	C <sub>5</sub>	C <sub>6</sub>	Σ D
		Width (CDC)	Max Crush								
2	FRONT BUMPER	57 1/2		57.5	15.5	7.75	6.0	5.25	5.75	2.75	C
	BUMPER TAPER			59	-3.5	-0.88	+0.5	+0.5	-0.88	-3.5	
	BASELINE ADJ.				C.C	0.00	6.5	5.75	4.87	5.25	
3	REAR BUMPER	59		58	7.25	5.0	3.25	2.25	1 7/8	2.5	C
	BUMPER TAPER			59	2.5	2.75	0.25	0.25	0.75	2.5	
	BASELINE ADJ.				4.75	4.25	3.00	2.00	1.13	C	

## National Accident Sampling System - Crashworthiness Data System: Exterior Vehicle Form

2b

## VEHICLE DAMAGE SKETCH

<b>TIRE - WHEEL DAMAGE</b> a. Rotation physically restricted RF <u>2</u> LF <u>1</u> RR <u>2</u> LR <u>2</u> (1) Yes (2) No (8) NA (9) Unk.		<b>b. Tire deflated</b> RF <u>1</u> LF <u>1</u> RR <u>2</u> LR <u>2</u>		<b>ORIGINAL SPECIFICATIONS</b> Wheelbase <u>100.5</u> Overall Length <u>179.6</u> Maximum Width <u>68.3</u> Curb Weight <u>2759</u> Average Track <u>56.8</u> Front Overhang <u>40.5</u> Rear Overhang <u>39.8</u> Engine Size: cyl./ displ. <u>5.0L V8 HO, EFI</u> Undeformed End Width <u>59</u>		<b>WHEEL STEER ANGLES</b> (For locked front wheels or displaced rear axles only) RF $\pm$ <u>0</u> <u>0</u> ° LF $\pm$ <u>0</u> <u>0</u> ° RR $\pm$ <u>0</u> <u>0</u> ° LR $\pm$ <u>0</u> <u>0</u> ° Within $\pm 5$ degrees	
<b>TYPE OF TRANSMISSION</b> <u>5 SPEED</u> <input checked="" type="checkbox"/> Manual <input type="checkbox"/> Automatic				<b>DRIVE WHEELS</b> <input type="checkbox"/> FWD <input checked="" type="checkbox"/> RWD <input type="checkbox"/> 4WD		Approximate Cargo Weight <u>          </u>	



NOTES: Sketch new perimeter and cross hatch direct damage and single hatch induced damage on all views. Annotate observations which might be useful in reconstructing the accident (e.g., grass in tire bead, direction of striations, scuff on sidewall, etc.). If pulling trailer, sketch type of trailer and damage received on the back of this page.

Annotate any damage caused by extrication such as component removal by torching, prying, or hydraulic shears.



## National Accident Sampling System – Crashworthiness Data System: Exterior Vehicle Form

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## COLLISION DEFORMATION CLASSIFICATION

## HIGHEST DELTA "V"

Accident Event Sequence Number	Object Contacted	(1) (2) Direction of Force	(3) Deformation Location	(4) Specific Longitudinal or Lateral Location	(5) Specific Vertical or Lateral Location	(6) Type of Damage Distribution	(7) Deformation Extent
4. <u>02</u>	5. <u>61</u>	6. <u>00</u>	7. <u>I</u>	8. <u>D</u>	9. <u>D</u>	10. <u>C</u>	11. <u>02</u>

## Second Highest Delta "V"

12. <u>01</u>	13. <u>60</u>	14. <u>00</u>	15. <u>U</u>	16. <u>D</u>	17. <u>D</u>	18. <u>W</u>	19. <u>02</u>
---------------	---------------	---------------	--------------	--------------	--------------	--------------	---------------

## CRUSH PROFILE

(The crush profile for the damage described in the CDC(s) above should be documented in the appropriate space below. ALL MEASUREMENTS ARE IN INCHES.)

## HIGHEST DELTA "V"

20. <u>L</u>	21. <u>C1</u>	<u>C2</u>	<u>C3</u>	<u>C4</u>	<u>C5</u>	<u>C6</u>	22. <u>-</u> <u>- D</u>
<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>+</u> <u>-</u> <u>---</u>

## Second Highest Delta "V"

23. <u>L</u>	24. <u>C1</u>	<u>C2</u>	<u>C3</u>	<u>C4</u>	<u>C5</u>	<u>C6</u>	25. <u>+</u> <u>- D</u>
<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>+</u> <u>-</u> <u>---</u>

26. Are CDCs Documented but Not Coded on The Automated File  
(0) No  
(1) Yes

0

27. Researcher's Assessment of Vehicle Disposition  
(0) Not towed due to vehicle damage  
(1) Towed due to vehicle damage  
(9) Unknown

1

28. Original Wheelbase  
100.5 Code to the nearest tenth of an inch  
(9999) Unknown

100.5

\*\*\* STOP: IF THE CDS APPLICABLE VEHICLE WAS NOT TOWED \*\*\*  
(I.E., GV09 = 0 OR 9), DO NOT COMPLETE THE INTERIOR VEHICLE FORM.



U.S. Department of Transportation  
National Highway Traffic Safety  
Administration

## INTERIOR VEHICLE FORM

NATIONAL ACCIDENT SAMPLING SYSTEM  
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number 10

2. Case Number - Stratum 9001

3. Vehicle Number 01

### INTEGRITY

4. Passenger Compartment Integrity 98

(00) No integrity loss

Yes, Integrity Was Lost Through

(01) Windshield

(02) Door (side)

(03) Door/hatch (rear)

(04) Roof

(05) Roof glass

(06) Side window

(07) Rear window

(08) Roof and roof glass

(09) Windshield and door (side)

(10) Windshield and roof

(11) Side and rear window

(12) Windshield and side window

(13) Door and side window

(98) Other combination of above (specify):

CRACKED LF L&R GLASS, FRONT SEAT BELTS

(99) Unknown

### Door, Tailgate Or Hatch Opening

5. LF 3 6. RF 1 7. LR 0 8. RR 0 9. TG/H 1

(0) No door/gate/hatch

(1) Door/gate/hatch remained closed and operational

(2) Door/gate/hatch came open during collision

(3) Door/gate/hatch jammed shut

(8) Other (specify):

(9) Unknown

Damage/Failure Associated with Door, Tailgate or Hatch Opening in Collision. If IV05-IV09 ≠ 2, Then Code 0.

10. LF 0 11. RF 0 12. LR 0 13. RR 0 14. TG/H 0

(0) No door gate/hatch or door not opened

Door, Tailgate, or Hatch Came Open During Collision

(1) Door operational (no damage)

(2) Latch striker failure due to damage

(3) Hinge failure due to damage

(4) Door structure failure due to damage

(5) Door support (i.e., pillar, sill, roof side rail, etc.) failure due to damage

(6) Latch/striker and hinge failure due to damage

(8) Other failure (specify):

(9) Unknown

### GLAZING

#### Glazing Damage from Impact Forces

15. WS 2 16. LF 6 17. RF 0 18. LR 6 19. RR 0  
20. BL 6 21. Roof 4 22. Other 0

(0) No glazing damage from impact forces

(2) Glazing in place and cracked from impact forces

(3) Glazing in place and holed from impact forces

(4) Glazing out-of-place (cracked or not) and not holed from impact forces

(5) Glazing out-of-place and holed from impact forces

(6) Glazing disintegrated from impact forces

(7) Glazing removed prior to accident

(8) No glazing

(9) Unknown if damaged

#### Glazing Damage from Occupant Contact

23. WS 2 24. LF 0 25. RF 0 26. LR 0 27. RR 0  
28. BL 0 29. Roof 0 30. Other 0

(0) No occupant contact to glazing or no glazing

(1) Glazing contacted by occupant but no glazing damage

(2) Glazing in place and cracked by occupant contact

(3) Glazing in place and holed by occupant contact

(4) Glazing out-of-place (cracked or not) by occupant contact and not holed by occupant contact

(5) Glazing out-of-place by occupant contact and holed by occupant contact

(6) Glazing disintegrated by occupant contact

(9) Unknown if contacted by occupant

If No Glazing Damage **And** No Occupant Contact or No Glazing, Then Code IV 31 Through IV 46 As 0

#### Type of Window/Windshield Glazing

31. WS 1 32. LF 2 33. RF 2 34. LR 2 35. RR 2  
36. BL 2 37. Roof 9 38. Other 0

(0) No glazing contact and no damage, or no glazing

(1) AS-1 - Laminated

(2) AS-2 - Tempered

(3) AS-3 - Tempered-tinted

(4) AS-14 - Glass/Plastic

(8) Other (specify):

(9) Unknown

#### Window Precrash Glazing Status

39. WS 1 40. LF 2 41. RF 2 42. LR 1 43. RR —  
44. BL 1 45. Roof 2 46. Other 0

(0) No glazing contact and no damage, or no glazing

(1) Fixed

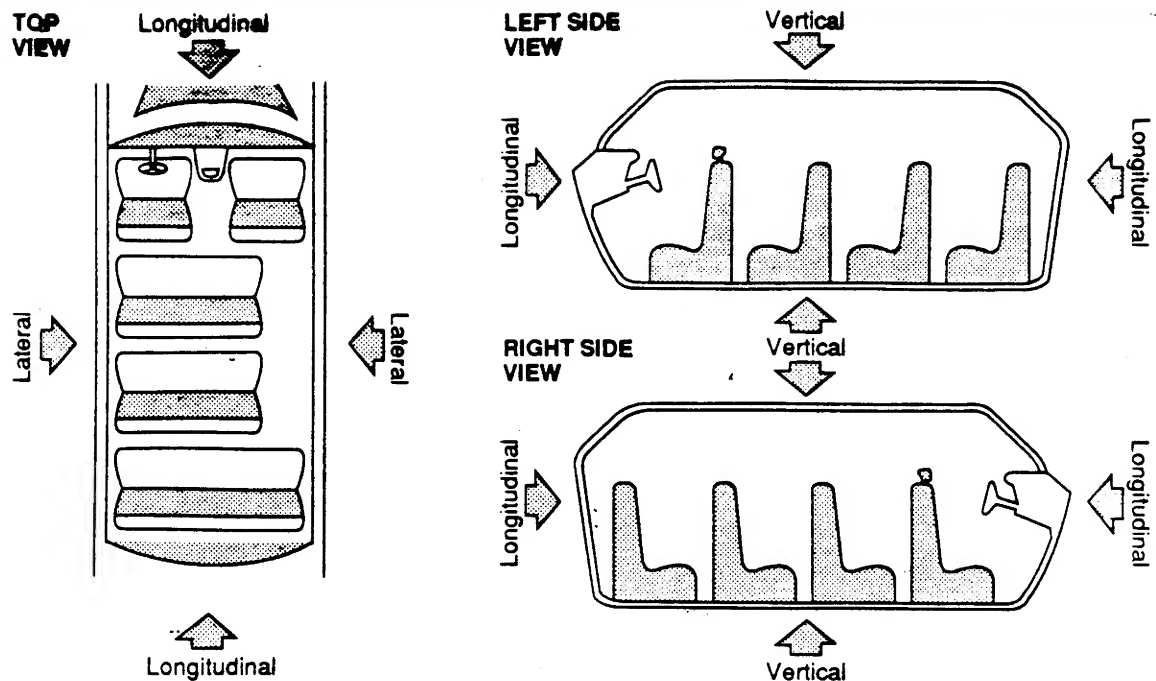
(2) Closed

(3) Partially opened

(4) Fully opened

(9) Unknown

## INTRUSION WORK SHEET



LOCATION OF INTRUSION	INTRUDED COMPONENT	COMPARISON VALUE	-	INTRUDED VALUE	=	INTRUSION	DOMINANT CRUSH DIRECTION
1-1	TOE PAN	20.75	-	16.5	=	4.25	LONG
1-1	LOWER A-PILLAR	19.25	-	16.5	=	2.75	LAT
1-1	FLOOR PAN	23.5	-	22.5	=	1.0	VERT
1-1	LF DOOR SILL - FORWARD	19.25	-	19.0	=	0.25	LAT
1-1	LF DOOR SILL - MID	34.75	-	35.0	=	-0.25	VERT
1-1	LF DOOR SILL - REAR	28.0	-	30.0	=	-2.0	VERT
2-1	LOWER B PILLAR	25.5	-	29.5	=	-4.0	VERT
2-1	UPPER C PILLAR	25.0	-	30.0	=	-5.0	VERT
2-1	FLOOR PAN	43.0	-	41.75	=	1.25	VERT
2-2	FLOOR PAN	46.0	-	41.75	=	4.25	VERT
			-		=		
			-		=		
			-		=		
			-		=		
			-		=		

Document no more than the 15 most severe intrusions

## OCCUPANT AREA INTRUSION

Note: If no intrusions, leave variables IV 47-IV 86 blank.

	Location of Intrusion	Intruding Component	Magnitude of Intrusion	Dominant Crush Direction
1st	47. <u>1</u> <u>1</u>	48. <u>0</u> <u>5</u>	49. <u>2</u>	50. <u>2</u>
2nd	51. <u>1</u> <u>1</u>	52. <u>0</u> <u>6</u>	53. <u>1</u>	54. <u>3</u>
3rd	55. <u>1</u> <u>1</u>	56. <u>1</u> <u>7</u>	57. <u>1</u>	58. <u>1</u>
4th	59. <u>2</u> <u>1</u>	60. <u>1</u> <u>7</u>	61. <u>1</u>	62. <u>1</u>
5th	63. <u>2</u> <u>2</u>	64. <u>1</u> <u>7</u>	65. <u>2</u>	66. <u>1</u>
6th	67. _____	68. _____	69. _____	70. _____
7th	71. _____	72. _____	73. _____	74. _____
8th	75. _____	76. _____	77. _____	78. _____
9th	79. _____	80. _____	81. _____	82. _____
10th	83. _____	84. _____	85. _____	86. _____

## LOCATION OF INTRUSION

Front Seat  
 (11) Left  
 (12) Middle  
 (13) Right

Second Seat  
 (21) Left  
 (22) Middle  
 (23) Right

Third Seat  
 (31) Left  
 (32) Middle  
 (33) Right

Fourth Seat  
 (41) Left  
 (42) Middle  
 (43) Right

(97) Catastrophic  
 (98) Other enclosed area (specify): \_\_\_\_\_

(99) Unknown

## INTRUDING COMPONENT

## Interior Components

- (01) Steering assembly
- (02) Instrument panel left
- (03) Instrument panel center
- (04) Instrument panel right
- (05) Toe pan
- (06) A-pillar
- (07) B-pillar
- (08) C-pillar
- (09) D-pillar
- (10) Door panel
- (12) Roof (or convertible top)
- (13) Roof side rail
- (14) Windshield
- (15) Windshield header
- (16) Window frame
- (17) Floor pan
- (18) Backlight header
- (19) Front seat back
- (20) Second seat back
- (21) Third seat back
- (22) Fourth seat back
- (23) Fifth seat back
- (24) Seat cushion
- (25) Back panel or door surface
- (26) Other interior component (specify): \_\_\_\_\_

- (27) Side panel - forward of the A-pillar
- (28) Side panel - rear of the A-pillar

## Exterior Components

- (30) Hood
- (31) Outside surface of vehicle (specify): \_\_\_\_\_
- (32) Other exterior object in the environment (specify): \_\_\_\_\_
- (33) Unknown exterior object
- (97) Catastrophic
- (98) Intrusion of unlisted component(s) (specify): \_\_\_\_\_
- (99) Unknown

## MAGNITUDE OF INTRUSION

- (1)  $\geq 1$  inch but  $< 3$  inches
- (2)  $\geq 3$  inches but  $< 6$  inches
- (3)  $\geq 6$  inches but  $< 12$  inches
- (4)  $\geq 12$  inches but  $< 18$  inches
- (5)  $\geq 18$  inches but  $< 24$  inches
- (6)  $\geq 24$  inches
- (7) Catastrophic
- (9) Unknown

## DOMINANT CRUSH DIRECTION

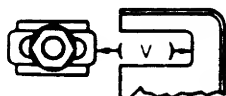
- (1) Vertical
- (2) Longitudinal
- (3) Lateral
- (7) Catastrophic
- (9) Unknown



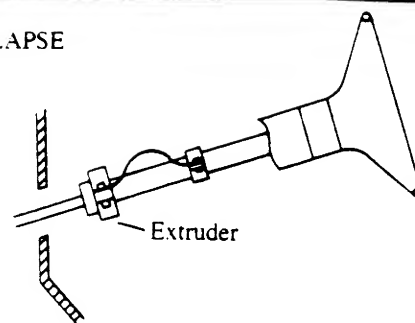
## STEERING COLUMN WORKING DIAGRAMS

### STEERING COLUMN COLLAPSE

Steering Column Shear Module Movement

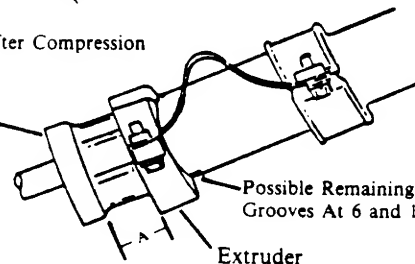
Left 2Right 0V = 0

Direction and Magnitude of Steering Column Movement



After Compression

Flare Tube



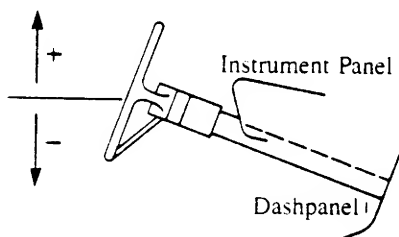
Possible Remaining Starter Grooves At 6 and 12 o'clock

Compression = Measurement A

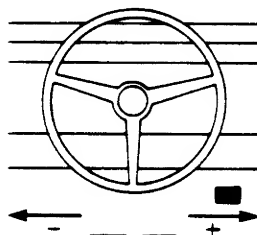
A = 13/16

### STEERING COLUMN MOVEMENT

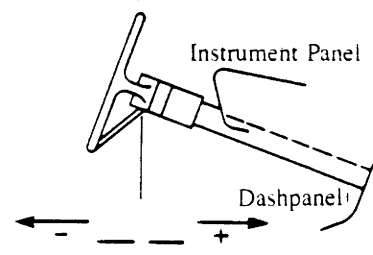
Vertical Movement



Lateral Movement



Longitudinal Movement



	COMPARISON VALUE	-	DAMAGED VALUE	=	MOVEMENT
VERTICAL		-		=	
LATERAL		-		=	
LONGITUDINAL		-		=	

### STEERING RIM/SPOKE DEFORMATION

COMPARISON VALUE	-	DAMAGED VALUE	=	DEFORMATION
	-		=	
	-		=	

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## STEERING COLUMN

87. Steering Column Type 1

- (1) Fixed column  
 (2) Tilt column  
 (3) Telescoping column  
 (4) Tilt and telescoping column  
 (8) Other column type (specify):  
 \_\_\_\_\_

(9) Unknown

If PDOF  $\neq$  11, 12 or 1, Then Code IV88-IV91 As 9688. Steering Column Collapse Due to Occupant Loading 01

13/16 Code actual measured movement to the nearest inch. See coding manual for measurement technique(s).

- (00) No movement, compression, or collapse  
 (01-19) Actual measured value  
 (20) 20 inches or greater

Estimated movement from observation

- (81) Less than 1 inch  
 (82)  $\geq 1$  inch but  $< 2$  inches  
 (83)  $\geq 2$  inches but  $< 4$  inches  
 (84)  $\geq 4$  inches but  $< 6$  inches  
 (85)  $\geq 6$  inches but  $< 8$  inches  
 (86) Greater than or equal to 8 inches  
 (96) Not assessed (PDOF  $\neq$  11, 12, 1)  
 (97) Apparent movement, value undetermined or cannot be measured or estimated  
 (98) Nonspecified type column  
 (99) Unknown

## Direction And Magnitude of Steering Column Movement

89. Vertical Movement 0090. Lateral Movement 0091. Longitudinal Movement 99

Code the actual measured movement to the nearest inch. See Coding Manual for measurement technique(s)

- (00) No steering column movement  
 (= 01 - = 49) Actual measured value  
 (= 50) 50 inches or greater

Estimated movement from observation

- (= 81)  $\geq 1$  inch but  $< 3$  inches  
 (= 82)  $\geq 3$  inches but  $< 6$  inches  
 (= 83)  $\geq 6$  inches but  $< 12$  inches  
 (= 84)  $\geq 12$  inches  
 (= 96) Not assessed (PDOF  $\neq$  11, 12, 1)  
 (= 97) Apparent movement  $> 1$  inch but cannot be measured or estimated  
 (= 99) Unknown

92. Steering Rim/Spoke Deformation 0

\_\_\_\_\_ Code actual measured deformation to the nearest inch.

- (0) No steering rim deformation  
 (1-5) Actual measured value  
 (6) 6 inches or more  
 (8) Observed deformation cannot be measured  
 (9) Unknown

93. Location of Steering Rim/Spoke Deformation 00

(00) No steering rim deformation

Quarter Sections

- (01) Section A  
 (02) Section B  
 (03) Section C  
 (04) Section D



Half Sections

- (05) Upper half of rim/spoke  
 (06) Lower half of rim/spoke  
 (07) Left half of rim/spoke  
 (08) Right half of rim/spoke



- (09) Complete steering wheel collapse  
 (10) Undetermined location  
 (99) Unknown

## INSTRUMENT PANEL

94. Odometer Reading 003,000

2,796 miles - Code mileage to the nearest 1,000 miles

- (000) No odometer  
 (001) Less than 1,500 miles  
 (300) 299,500 miles or more  
 (999) Unknown

Source \_\_\_\_\_

95. Instrument Panel Damage from Occupant Contact? 1

- (0) No  
 (1) Yes  
 (9) Unknown

## 96. Knee Bolsters Deformed from Occupant Contact? \_\_\_\_\_

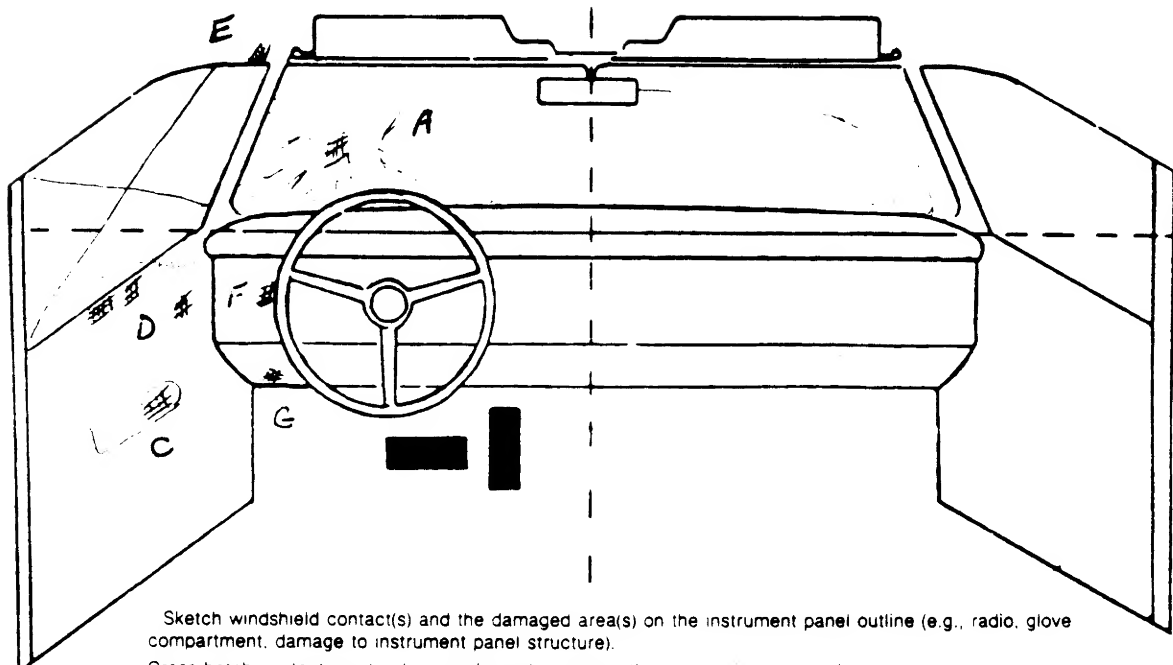
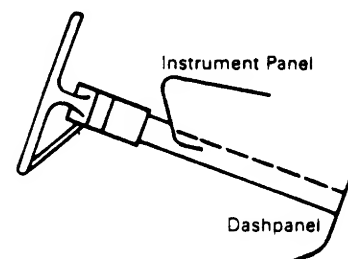
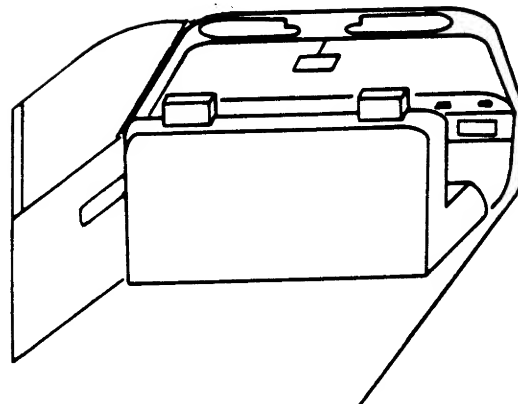
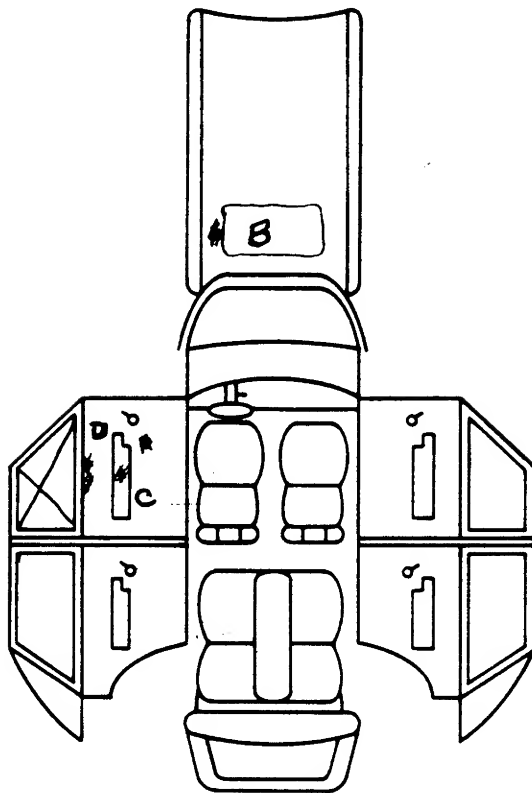
- (0) No  
 (1) Yes  
 (8) Not present  
 (9) Unknown

97. Did Glove Compartment Door Open During Collision(s)? 0

- (0) No  
 (1) Yes  
 (8) Not present  
 (9) Unknown

## VEHICLE INTERIOR SKETCHES

Note area of ejection/entrapment



Sketch windshield contact(s) and the damaged area(s) on the instrument panel outline (e.g., radio, glove compartment, damage to instrument panel structure).

Cross hatch contact points, draw spider webs or use other annotation as may be appropriate.

Annotate the contacted area with a letter (begin with A) and list on the Points of Occupant Contact page.

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## POINTS OF OCCUPANT CONTACT

Contact	Interior Component Contacted	Occupant No. If Known	Body Region If Known	Supporting Physical Evidence	Confidence Level of Contact Point
A	01	01	HEAD	SKIN-OIL SMUDGE	1
B	54	01	UNK	SMUDGE	1
C	21	01	UNK	DEPRESSION	1
D	20	01	UNK	DEPRESSIONS (3)	1
E	26	01	HEAD	SKIN-OIL SMUDGE	1
F	09	01	UNK	DEPRESSION	1
G	13	01	LEFT LEG	DEPRESSION	1
H					
I					
J					
K					
L					
M					
N					

## CODES FOR INTERIOR COMPONENTS

## FRONT

- (01) Windshield
- (02) Mirror
- (03) Sunvisor
- (04) Steering wheel rim
- (05) Steering wheel hub/spoke
- (06) Steering wheel (combination of codes 04 and 05)
- (07) Steering column, transmission selector lever, other attachment
- (08) Add on equipment (e.g., CB, tape deck, air conditioner)
- (09) Left instrument panel and below
- (10) Center instrument panel and below
- (11) Right instrument panel and below
- (12) Glove compartment door
- (13) Knee bolster
- (14) Windshield including one or more of the following: front header, A-pillar, instrument panel, mirror, or steering assembly (driver side only)
- (15) Windshield including one or more of the following: front header, A-pillar, instrument panel, or mirror (passenger side only)
- (16) Other front object (specify): \_\_\_\_\_

## LEFT SIDE

- (20) Left side interior surface, excluding hardware or armrests
- (21) Left side hardware or armrest
- (22) Left A pillar
- (23) Left B pillar
- (24) Other left pillar (specify): \_\_\_\_\_
- (25) Left side window glass or frame

- (26) Left side window glass including one or more of the following: frame, window sill, A-pillar, B-pillar, or roof side rail
- (27) Other left side object (specify): \_\_\_\_\_

## RIGHT SIDE

- (30) Right side interior surface, excluding hardware or armrests
- (31) Right side hardware or armrest
- (32) Right A pillar
- (33) Right B pillar
- (34) Other right pillar (specify): \_\_\_\_\_
- (35) Right side window glass or frame
- (36) Right side window glass including one or more of the following: frame, window sill, A-pillar, B-pillar, or roof side rail
- (37) Other right side object (specify): \_\_\_\_\_

## INTERIOR

- (40) Seat, back support
- (41) Belt restraint webbing/buckle
- (42) Belt restraint B-pillar attachment point
- (43) Other restraint system component (specify): \_\_\_\_\_
- (44) Head restraint system
- (45) Air bag
- (46) Other occupants (specify): \_\_\_\_\_
- (47) Interior loose objects

- (48) Child safety seat (specify): \_\_\_\_\_

- (49) Other interior object (specify): \_\_\_\_\_

## ROOF

- (50) Front header
- (51) Rear header
- (52) Roof left side rail
- (53) Roof right side rail
- (54) Roof or convertible top

## FLOOR

- (56) Floor including toe pan
- (57) Floor or console mounted transmission lever, including console
- (58) Parking brake handle
- (59) Foot controls including parking brake

## REAR

- (60) Backlight (rear window)
- (61) Backlight storage rack, door, etc.
- (62) Other rear object (specify): \_\_\_\_\_

## CONFIDENCE LEVEL OF CONTACT POINT

- (1) Certain
- (2) Probable
- (3) Possible
- (4) Unknown

## AUTOMATIC RESTRAINTS

**NOTES:** Encode the data for each applicable front seat position. The attributes for the variables may be found below. Restraint systems should be assessed during the vehicle inspection then coded on the Occupant Assessment Form.

		Left	Center	Right
F I R S T	Availability	/	0	0
	Function	4	0	0
	Failure	/	0	0

### Automatic (Passive) Restraint System Availability

- (0) Not equipped/not available
- (1) Airbag
- (2) Airbag disconnected (specify): \_\_\_\_\_
- (3) Airbag not reinstalled
- (4) 2 point automatic belts
- (5) 3 point automatic belts
- (6) Automatic belts destroyed or rendered inoperative
- (9) Unknown

### Automatic (Passive) Restraint Function

- (0) Not equipped/not available

#### Automatic Belt

- (1) Automatic belt in use
- (2) Automatic belt not in use
- (3) Automatic belt use unknown

#### Air Bag

- (4) Airbag deployed during accident
- (5) Airbag deployed inadvertently just prior to accident
- (6) Deployed, accident sequence undetermined
- (7) Nondeployed
- (8) Unknown if deployed
- (9) Unknown

### Did Automatic (Passive) Restraint Fail

- (0) Not equipped/not available
- (1) No
- (2) Yes (specify): \_\_\_\_\_
- (9) Unknown

## MANUAL RESTRAINTS

NOTES: Encode the applicable data for each seat position in the vehicle. The attributes for the variables may be found below. Restraint systems should be assessed during the vehicle inspection then coded on the Occupant Assessment Form.

If a child safety seat is present, encode the data on the back of this page.

If the vehicle has automatic restraints available, encode the appropriate data on the back of the previous page.

		Left	Center	Right
FIRST	Availability	4	0	4
	Use	00	00	00
	Failure Modes	0	0	0
SECOND	Availability	4	0	4
	Use	00	00	00
	Failure Modes	0	0	0
THIRD	Availability			
	Use			
	Failure Modes			
OTHER	Availability			
	Use			
	Failure Modes			

## Manual (Active) Belt System Availability

- (0) Not available
- (1) Belt removed/destroyed
- (2) Shoulder belt
- (3) Lap belt
- (4) Lap and shoulder belt
- (5) Belt available - type unknown
- (8) Other belt (specify):

(9) Unknown

## Manual (Active) Belt System Use

- (00) None used, not available, or belt removed/destroyed
- (01) Inoperative (specify):

- (02) Shoulder belt
- (03) Lap belt
- (04) Lap and shoulder belt
- (05) Belt used - type unknown

(08) Other belt used (specify):

- (12) Shoulder belt used with child safety seat
- (13) Lap belt used with child safety seat
- (14) Lap and shoulder belt used with child safety seat
- (15) Belt used with child safety seat - type unknown
- (18) Other belt used with child safety seat (specify):

(99) Unknown if belt used

## Manual (Active) Belt Failure Modes During Accident

- (0) No manual belt used or not available
- (1) No manual belt failure(s)
- (2) Torn webbing (stretched webbing not included)
- (3) Broken buckle or latchplate
- (4) Upper anchorage separated
- (5) Other anchorage separated (specify):

- (6) Broken retractor
- (7) Combination of above (specify):

(8) Other manual belt failure (specify):

(9) Unknown

## National Accident Sampling System – Crashworthiness Data System: Interior Vehicle Form

Page 7

## HEAD RESTRAINTS/SEAT EVALUATION

NOTES: Encode the applicable data for each seat position in the vehicle. The attributes for these variables may be found at the bottom of the page. Head restraint type/damage and seat type/performance should be assessed during the vehicle inspection then coded on the Occupant Assessment Form.

		Left	Center	Right
FIRST	Head Restraint Type/Damage	3	0	3
	Seat Type	01	00	02
	Seat Performance	5	0	1
SECOND	Head Restraint Type/Damage	0	0	0
	Seat Type	04	00	04
	Seat Performance	1	0	1
THIRD	Head Restraint Type/Damage			
	Seat Type			
	Seat Performance			
OTHER	Head Restraint Type/Damage			
	Seat Type			
	Seat Performance			

## Head Restraint Type/Damage by Occupant at This Occupant Position

- (0) No head restraints
- (1) Integral – no damage
- (2) Integral – damaged during accident
- (3) Adjustable – no damage
- (4) Adjustable – damaged during accident
- (5) Add-on – no damage
- (6) Add-on – damaged during accident
- (8) Other (specify): \_\_\_\_\_
- (9) Unknown

## Seat Type (This Occupant Position)

- (00) No seat
- (01) Bucket
- (02) Bucket with folding back
- (03) Bench
- (04) Bench with separate back cushions
- (05) Bench with folding back(s)
- (06) Split bench with separate back cushions
- (07) Split bench with folding back(s)
- (08) Pedestal (i.e., van type)
- (09) Other seat type (specify): \_\_\_\_\_
- (99) Unknown

## Seat Performance (This Occupant Position)

- (0) No seat
- (1) No seat performance failure(s)
- (2) Seat adjusters failed
- (3) Seat back folding locks failed
- (4) Seat tracks/anchors failed
- (5) Deformed by impact of occupant
- (6) Deformed by passenger compartment intrusion (specify): \_\_\_\_\_

- (7) Combination of above (specify): \_\_\_\_\_
- (8) Other (specify): \_\_\_\_\_

- (9) Unknown

DESCRIBE ANY INDICATION OF ABNORMAL OCCUPANT POSTURE (I.E. UNUSUAL OCCUPANT CONTACT PATTERN)


**EJECTION/ENTRAPMENT DATA**

Complete the following if the researcher has any indications that an occupant was either ejected from or entrapped in the vehicle. Code the appropriate data on the Occupant Assessment Form.

**EJECTION**      No [ ]      Yes [✓]

Describe indications of ejection and body parts involved in partial ejection(s):

EXIT SMUDGES ON LEFT SIDE OF SUNROOF AREA. BODY OF DRIVER FORWARD  
AND TO RIGHT OF VEHICLE'S FRONT-RIGHT CORNER.

Occupant Number	01					
Ejection	1					
(Note on Vehicle Interior Sketch) Ejection Area	7					
Ejection Medium	2					
Medium Status	2					

**Ejection**

- (1) Complete ejection
- (2) Partial ejection
- (3) Ejection, unknown degree
- (9) Unknown

**Ejection Area**

- (1) Windshield
- (2) Left front
- (3) Right front
- (4) Left rear
- (5) Right rear
- (6) Rear

## (7) Roof

- (8) Other area (e.g., back of pickup, etc.) (specify):

- (9) Unknown

**Ejection Medium**

- (1) Door/hatch/tailgate
- (2) Nonfixed roof structure
- (3) Fixed glazing
- (4) Nonfixed glazing (specify):

## (5) Integral structure

- (8) Other medium (specify):

- (9) Unknown

**Medium Status (Immediately Prior to Impact)**

- (1) Open
- (2) Closed
- (3) Integral structure
- (9) Unknown

**ENTRAPMENT**      No [ ]      Yes [ ]

Describe entrapment mechanism: \_\_\_\_\_

Component(s): \_\_\_\_\_

(Note in vehicle interior diagram)



**Appendix D:**

**NASS Interview Form**



U.S. Department of Transportation  
National Highway Traffic Safety  
Administration

## INTERVIEW FORM

NATIONAL ACCIDENT SAMPLING SYSTEM  
CRASHWORTHINESS DATA SYSTEM

Primary Sampling Unit Number 10 Interviewee(s) Role(s) or Name(s) \_\_\_\_\_

Case Number - Stratum 9001 \_\_\_\_\_

Vehicle Number 01 \_\_\_\_\_

Review the Interview Cue Sheet prior to conducting interview(s) to ensure the acquisition of all pertinent data.

### GENERAL DESCRIPTION OF ACCIDENT SEQUENCE

NO INTERVIEW

SINGLE OCCUPANT FATALITY

WIFE REFUSED INTERVIEW AND MEDICAL RELEASE

### SPECIFIC QUESTIONS

Key to Researcher: Have you obtained the following through the interviewee(s) description and specific questions?

<input type="checkbox"/> PRE-CRASH, AT IMPACT	<input type="checkbox"/> Speed estimates (precrash/at impact)	<input type="checkbox"/> Previous vehicle damage
<input type="checkbox"/> vehicle travel driver intention	<input type="checkbox"/> Post-impact trajectory	<input type="checkbox"/> Glazing type
<input type="checkbox"/> Direction of travel	<input type="checkbox"/> Door status precrash/postcrash	<input type="checkbox"/> Vehicle glazing status
<input type="checkbox"/> Avoidance maneuvers	<input type="checkbox"/> Final rest position	<input type="checkbox"/> PAR classifications
<input type="checkbox"/> Impact description/orientation		<input type="checkbox"/> Glove box status

Cargo? ☐ No ☐ Yes Interviewee's Estimate of Cargo Weight \_\_\_\_\_

Description of Cargo \_\_\_\_\_

Present Location of Vehicle (if not yet inspected)? \_\_\_\_\_

**Appendix E:**

**NASS Occupant Forms**



U.S. Department of Transportation  
National Highway Traffic Safety  
Administration

# OCCUPANT ASSESSMENT FORM

Form Approved  
O.M.B. No. 2127-0021  
NATIONAL ACCIDENT SAMPLING SYSTEM  
CRASHWORTHINESS DATA SYSTEM

<p>1. Primary Sampling Unit Number <u>10</u></p> <p>2. Case Number—Stratum <u>9001</u></p> <p>3. Vehicle Number <u>01</u></p> <p>4. Occupant Number <u>01</u></p>	<p>11. Occupant's Posture <u>9</u></p> <p>(0) Normal posture</p> <p>(1) Abnormal posture (specify): _____</p> <p>(9) Unknown</p>
OCCUPANT'S CHARACTERISTICS	
<p>5. Occupant's Age <u>33</u></p> <p>Code actual age at time of accident.</p> <p>(00) Less than one year old (specify by month): _____</p> <p>(97) 97 years and older</p> <p>(99) Unknown</p> <p>6. Occupant's Sex <u>1</u></p> <p>(1) Male</p> <p>(2) Female</p> <p>(9) Unknown</p> <p>7. Occupant's Height <u>75</u></p> <p>Code actual height to the nearest inch.</p> <p>(99) Unknown</p> <p>8. Occupant's Weight <u>180</u></p> <p>Code actual weight to the nearest pound.</p> <p>(999) Unknown</p> <p>9. Occupant's Role <u>1</u></p> <p>(1) Driver</p> <p>(2) Passenger</p> <p>(9) Unknown</p> <p>10. Occupant's Seat Position <u>11</u></p> <p>Front Seat</p> <p>(11) Left side</p> <p>(12) Middle</p> <p>(13) Right side</p> <p>(14) Other (specify): _____</p> <p>Second Seat</p> <p>(21) Left side</p> <p>(22) Middle</p> <p>(23) Right side</p> <p>(24) Other (specify): _____</p> <p>Third Seat</p> <p>(31) Left side</p> <p>(32) Middle</p> <p>(33) Right side</p> <p>(34) Other (specify): _____</p> <p>Fourth Seat</p> <p>(41) Left side</p> <p>(42) Middle</p> <p>(43) Right side</p> <p>(44) Other (specify): _____</p> <p>(97) In or on unenclosed area</p> <p>(98) Other seat (specify): _____</p> <p>(99) Unknown</p>	<p style="text-align: center; background-color: black; color: white; font-weight: bold;">EJECTION/ENTRAPMENT</p> <p>12. Ejection <u>1</u></p> <p>(0) No ejection</p> <p>(1) Complete ejection</p> <p>(2) Partial ejection</p> <p>(3) Ejection, unknown degree</p> <p>(9) Unknown</p> <p>13. Ejection Area <u>7</u></p> <p>(0) No ejection</p> <p>(1) Windshield</p> <p>(2) Left front</p> <p>(3) Right front</p> <p>(4) Left rear</p> <p>(5) Right rear</p> <p>(6) Rear</p> <p>(7) Roof</p> <p>(8) Other area (e.g., back of pickup, etc.)</p> <p>(specify): _____</p> <p>(9) Unknown</p> <p>14. Ejection Medium <u>2</u></p> <p>(0) No ejection</p> <p>(1) Door/hatch/tailgate</p> <p>(2) Nonfixed roof structure</p> <p>(3) Fixed glazing</p> <p>(4) Nonfixed glazing (specify): _____</p> <p>(5) Integral structure</p> <p>(8) Other medium (specify): _____</p> <p>(9) Unknown</p> <p>15. Medium Status (Immediately Prior to Impact) <u>2</u></p> <p>(0) No ejection</p> <p>(1) Open</p> <p>(2) Closed</p> <p>(3) Integral structure</p> <p>(9) Unknown</p> <p>16. Entrapment <u>0</u></p> <p>(NOTE: Entrapped means that part of the person was in the vehicle and mechanically restrained; jammed doors and immobilizing injuries by themselves are not sufficient to constitute entrapment.)</p> <p>(0) Not entrapped</p> <p>(1) Entrapped</p> <p>(9) Unknown</p>

## National Accident Sampling System – Crashworthiness Data System: Occupant Assessment Form

Page 2

## RESTRAINT SYSTEM AND SEAT EVALUATION

17. Manual (Active) Belt System Availability 4

- (0) Not available
- (1) Belt removed/destroyed
- (2) Shoulder belt
- (3) Lap belt
- (4) Lap and shoulder belt
- (5) Belt available – type unknown
- (8) Other belt (specify): \_\_\_\_\_

(9) Unknown

18. Manual (Active) Belt System Use 00

- (00) None used, not available, or belt removed/destroyed
- (01) Inoperative (specify): \_\_\_\_\_

- (02) Shoulder belt
- (03) Lap belt
- (04) Lap and shoulder belt
- (05) Belt used – type unknown
- (08) Other belt used (specify): \_\_\_\_\_
- (12) Shoulder belt used with child safety seat
- (13) Lap belt used with child safety seat
- (14) Lap and shoulder belt used with child safety seat
- (15) Belt used with child safety seat – type unknown
- (18) Other belt used with child-safety seat (specify): \_\_\_\_\_

(99) Unknown if belt used

19. Proper Use of Manual (Active) Belts 0

- (0) None used or not available
- (1) Belt used properly
- (2) Belt used properly with child safety seat

Belt Used Improperly

- (3) Shoulder belt worn under arm
- (4) Shoulder belt worn behind back or seat
- (5) Belt worn around more than one person
- (6) Lap belt worn on abdomen
- (7) Lap belt or lap and shoulder belt used improperly with child safety seat (specify): \_\_\_\_\_

(8) Other improper use of manual belt system (specify): \_\_\_\_\_

(9) Unknown

20. Manual (Active) Belt Failure Modes During Accident 0

- (0) No manual belt used or not available
- (1) No manual belt failure(s)
- (2) Torn webbing (stretched webbing not included)
- (3) Broken buckle or latchplate
- (4) Upper anchorage separated
- (5) Other anchorage separated (specify): \_\_\_\_\_

(6) Broken retractor

(7) Combination of above (specify): \_\_\_\_\_

(8) Other manual belt failure (specify): \_\_\_\_\_

(9) Unknown

21. Automatic (Passive) Restraint System Availability 1

- (0) Not equipped/not available
- (1) Airbag
- (2) Airbag disconnected (specify): \_\_\_\_\_

- (3) Airbag not reinstalled
- (4) 2 point automatic belts
- (5) 3 point automatic belts
- (6) Automatic belts destroyed or rendered inoperative
- (9) Unknown

22. Automatic (Passive) Restraint Function 4

- (0) Not equipped/not available

Automatic Belt

- (1) Automatic belt in use
- (2) Automatic belt not in use
- (3) Automatic belt use unknown

Air Bag

- (4) Airbag deployed during accident
- (5) Airbag deployed inadvertently just prior to accident
- (6) Deployed, accident sequence undetermined
- (7) Nondeployed
- (8) Unknown if deployed
- (9) Unknown

23. Did Automatic (Passive) Restraint Fail? 1

- (0) Not equipped/not available
- (1) No
- (2) Yes (specify): \_\_\_\_\_

(9) Unknown

24. Police Reported Restraint Use 0

- (0) None used
- (1) Police did not indicate restraint use
- (2) Shoulder belt
- (3) Lap belt
- (4) Lap and shoulder belt
- (5) Belt used, type not specified
- (6) Child safety seat
- (7) Other or automatic restraint (specify): \_\_\_\_\_

(8) Restrained, type unknown

(9) Police indicated "unknown"

25. Head Restraint Type/Damage by Occupant at This Occupant Position 3

- (0) No head restraints
- (1) Integral – no damage
- (2) Integral – damaged during accident
- (3) Adjustable – no damage
- (4) Adjustable – damaged during accident
- (5) Add-on – no damage
- (6) Add-on – damaged during accident
- (8) Other (specify): \_\_\_\_\_

(9) Unknown

## National Accident Sampling System – Crashworthiness Data System: Occupant Assessment Form

Page 3

**26. Seat Type (This Occupant Position)** 02

- (00) Occupant not seated or no seat
- (01) Bucket
- (02) Bucket with folding back
- (03) Bench
- (04) Bench with separate back cushions
- (05) Bench with folding back(s)
- (06) Split bench with separate back cushions
- (07) Split bench with folding back(s)
- (08) Pedestal (i.e., van type)
- (09) Other seat type (specify):

(99) Unknown

**27. Seat Performance (This Occupant Position)** 8

- (0) Occupant not seated or no seat
- (1) No seat performance failure(s)
- (2) Seat adjusters failed
- (3) Seat back folding locks failed
- (4) Seat track/anchors failed
- (5) Deformed by impact of occupant
- (6) Deformed by passenger compartment intrusion (specify):

(7) Combination of above (specify):

(8) Other (specify):

ROTATED SLIGHTLY ON TRIM DURING COLLISION

(9) Unknown

FORCES**CHILD SAFETY SEAT****28. Child Safety Seat Make/Model** 000

(000) No child safety seat

Applicable codes are found in your NASS CDS Data Collection, Coding, and Editing Manual

(997) Other make/model (specify):

(998) Unknown make/model

(999) Unknown if child safety seat used

**29. Type of Child Safety Seat** —

- (0) No child safety seat
- (1) Infant seat
- (2) Toddler seat
- (3) Convertible seat
- (4) Booster seat
- (7) Other type child safety seat (specify):

(8) Unknown child safety seat type

(9) Unknown if child safety seat used

**30. Child Safety Seat Orientation** C C

(00) No child safety seat

Designed for Rear Facing for This Age/Weight

- (01) Rear facing
- (02) Forward facing
- (08) Other orientation (specify):

(09) Unknown orientation

Designed for Forward Facing for This Age/Weight

- (11) Rear facing
- (12) Forward facing
- (18) Other orientation (specify):

(19) Unknown orientation

Unknown Design or Orientation for This Age/Weight, or Unknown Age/Weight

- (21) Rear facing
- (22) Forward facing
- (28) Other orientation (specify):

(29) Unknown orientation

(99) Unknown if child safety seat used

**31. Child Safety Seat Harness Usage** 0 C**32. Child Safety Seat Shield Usage** 0 C**33. Child Safety Seat Tether Usage** 0 C

Note: Options below applicable to Variables OA31-OA33.

(00) No child safety seat

Not Designed with  
Harness/Shield/Tether

- (01) After market harness/shield/tether added, not used
- (02) After market harness/shield/tether used
- (03) Child safety seat used, but no after market harness/shield/tether added
- (09) Unknown if harness/shield/tether added or used

Designed with Harness/Shield/Tether

- (11) Harness/shield/tether not used
- (12) Harness/shield/tether used
- (19) Unknown if harness/shield/tether used

Unknown If Designed with Harness/Shield/Tether

- (21) Harness/shield/tether not used
- (22) Harness/shield/tether used
- (29) Unknown if harness/shield/tether used

(99) Unknown if child safety seat used

## National Accident Sampling System - Crashworthiness Data System: Occupant Assessment Form

Page 4

## INJURY CONSEQUENCES

34. Injury Severity (Police Rating) 4

- (0) O - No injury
- (1) C - Possible injury
- (2) B - Nonincapacitating injury
- (3) A - Incapacitating injury
- (4) K - Killed
- (5) U - Injury, severity unknown
- (6) Died prior to accident
- (9) Unknown

35. Treatment - Mortality 1

- (0) No treatment
- (1) Fatal
- (2) Fatal - ruled disease
- Nonfatal
- (3) Hospitalized
- (4) Transported and released
- (5) Treatment at scene - nontransported
- (6) Treatment later
- (8) Treatment - other (specify): \_\_\_\_\_
- (9) Unknown

36. Type of Medical Facility (for Initial Treatment) 0

- (0) Not treated at a medical facility
- (1) Trauma center
- (2) Hospital
- (3) Medical clinic
- (4) Physician's office
- (5) Treatment later at medical facility
- (8) Other (specify): \_\_\_\_\_
- (9) Unknown

37. Hospital stay 0 0

- 0 Code number of days (up through 60) that the occupant stayed in the hospital
- (00) Not hospitalized
- (61) 61 days or more
- (99) Unknown

38. Working Days Lost 6 2

- 0 Code the number of days (up through 60) that the occupant lost from work due to the accident
- (00) No working days lost
- (61) 61 days or more
- (62) Fatally injured
- (97) Not working prior to accident
- (99) Unknown

39. Time to Death 0 1

- Code number of hours from time of accident to time of death up through 24 hours. If time of death is greater than 24 hours, code number of days. (Note: 1 day = 31, 2 days = 32, ... n days = 30 + n up through 30 days = 60)
- (00) Not fatal
- (96) Fatal - ruled disease
- (99) Unknown

40. 1st Medically Reported Cause of Death 0 841. 2nd Medically Reported Cause of Death 0 142. 3rd Medically Reported Cause of Death 0 3

- Code the Occupant Injury from line number(s) for the medically reported injury(s) which reportedly contributed to this occupant's death
- (00) Not fatal or no additional causes
- (97) Other result (specify): \_\_\_\_\_
- (99) Unknown

43. Number of Recorded Injuries for This Occupant 1 8

- 1 8 Code the actual number of injuries recorded for this occupant.
- (00) No recorded injuries
- (97) Injured, details unknown
- (99) Unknown if injured

UPDATE CANDIDATE

NO [✓]

YES [ ]

\*\*\* STOP HERE \*\*\*

IF THERE ARE NO RECORDED INJURIES  
(I.E., OA43=00, 97, 99)



U.S. Department of Transportation  
National Highway Traffic Safety  
Administration

Form Approved  
O.M.B. No. 2127-0021  
NATIONAL ACCIDENT SAMPLING SYSTEM  
CRASHWORTHINESS DATA SYSTEM

## OCCUPANT INJURY FORM

1. Primary Sampling Unit Number 10 3. Vehicle Number 01  
2. Case Number - Stratum 9001 4. Occupant Number 01

### INJURY DATA

Record below the actual injuries sustained by this occupant that were identified from the official and unofficial data sources. Remember not to double count an injury just because it was identified from two different sources. If greater than ten injuries have been documented, encode the balance on the Occupant Injury Supplement.

	Source of Injury Data	Body Region	Aspect	Lesion	System Organ	A.I.S. Severity	Injury Source	Injury Source Confidence Level	Direct/ Indirect Injury	Occupant Area Intrusion No.
1st	5. <u>1</u>	6. <u>C</u>	7. <u>C</u>	8. <u>L</u>	9. <u>A</u>	10. <u>4</u>	11. <u>68</u>	12. <u>2</u>	13. <u>1</u>	14. <u>00</u>
2nd	15. <u>1</u>	16. <u>C</u>	17. <u>C</u>	18. <u>C</u>	19. <u>H</u>	20. <u>3</u>	21. <u>68</u>	22. <u>2</u>	23. <u>1</u>	24. <u>00</u>
3rd	25. <u>1</u>	26. <u>C</u>	27. <u>C</u>	28. <u>L</u>	29. <u>R</u>	30. <u>3</u>	31. <u>68</u>	32. <u>2</u>	33. <u>1</u>	34. <u>00</u>
4th	35. <u>1</u>	36. <u>H</u>	37. <u>I</u>	38. <u>F</u>	39. <u>S</u>	40. <u>3</u>	41. <u>54</u>	42. <u>3</u>	43. <u>1</u>	44. <u>00</u>
5th	45. <u>1</u>	46. <u>H</u>	47. <u>L</u>	48. <u>F</u>	49. <u>S</u>	50. <u>2</u>	51. <u>26</u>	52. <u>3</u>	53. <u>1</u>	54. <u>02</u>
6th	55. <u>1</u>	56. <u>B</u>	57. <u>S</u>	58. <u>F</u>	59. <u>S</u>	60. <u>3</u>	61. <u>54</u>	62. <u>3</u>	63. <u>1</u>	64. <u>00</u>
7th	65. <u>1</u>	66. <u>B</u>	67. <u>S</u>	68. <u>F</u>	69. <u>S</u>	70. <u>2</u>	71. <u>68</u>	72. <u>2</u>	73. <u>1</u>	74. <u>00</u>
8th	75. <u>1</u>	76. <u>C</u>	77. <u>B</u>	78. <u>F</u>	79. <u>S</u>	80. <u>4</u>	81. <u>68</u>	82. <u>2</u>	83. <u>1</u>	84. <u>00</u>
9th	85. <u>1</u>	86. <u>S</u>	87. <u>L</u>	88. <u>F</u>	89. <u>S</u>	90. <u>2</u>	91. <u>20</u>	92. <u>3</u>	93. <u>1</u>	94. <u>00</u>
10th	95. <u>1</u>	96. <u>S</u>	97. <u>R</u>	98. <u>F</u>	99. <u>S</u>	100. <u>2</u>	101. <u>68</u>	102. <u>2</u>	103. <u>1</u>	104. <u>00</u>



### OCCUPANT INJURY DATA

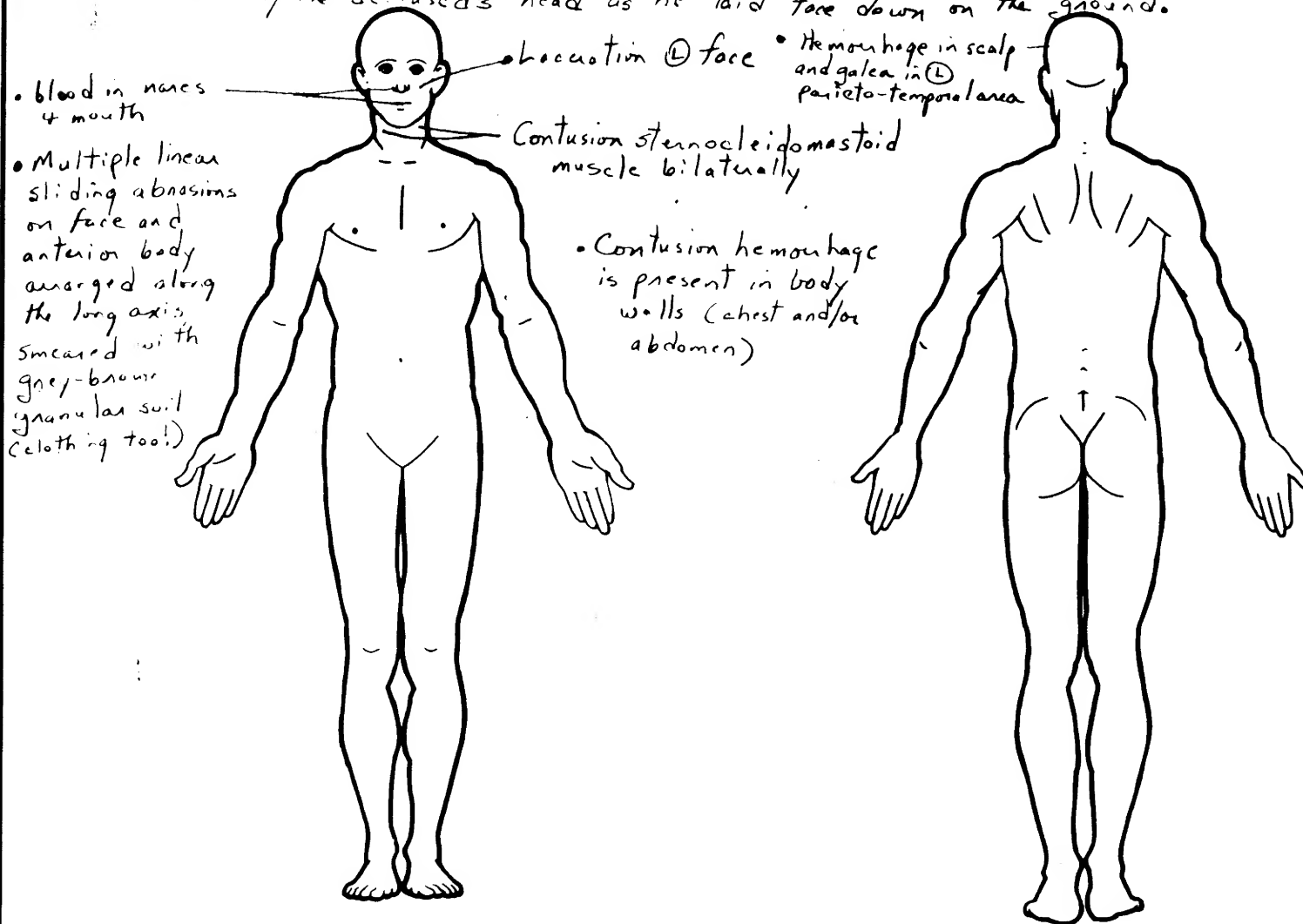
	Source of Injury Data	Body Region	Aspect	Lesion	System Organ	A.I.S. Severity	Injury Source	Injury Source Confidence Level	Direct/ Indirect Injury	Occupant Area Intrusion No.
11th	<u>I</u>	<u>S</u>	<u>R</u>	<u>D</u>	<u>J</u>	<u>2</u>	<u>68</u>	<u>2</u>	<u>1</u>	<u>00</u>
12th	<u>I</u>	<u>N</u>	<u>A</u>	<u>F</u>	<u>R</u>	<u>3</u>	<u>63</u>	<u>2</u>	<u>1</u>	<u>00</u>
13th	<u>I</u>	<u>T</u>	<u>L</u>	<u>F</u>	<u>S</u>	<u>3</u>	<u>77</u>	<u>1</u>	<u>7</u>	<u>99</u>
14th	<u>I</u>	<u>F</u>	<u>L</u>	<u>L</u>	<u>I</u>	<u>1</u>	<u>26</u>	<u>3</u>	<u>1</u>	<u>02</u>
15th	<u>I</u>	<u>O</u>	<u>A</u>	<u>A</u>	<u>I</u>	<u>1</u>	<u>86</u>	<u>1</u>	<u>1</u>	<u>00</u>
16th	<u>I</u>	<u>N</u>	<u>L</u>	<u>C</u>	<u>M</u>	<u>1</u>	<u>68</u>	<u>2</u>	<u>1</u>	<u>00</u>
17th	<u>I</u>	<u>N</u>	<u>R</u>	<u>C</u>	<u>M</u>	<u>1</u>	<u>68</u>	<u>2</u>	<u>1</u>	<u>00</u>
18th	<u>I</u>	<u>C</u>	<u>L</u>	<u>C</u>	<u>E</u>	<u>1</u>	<u>68</u>	<u>2</u>	<u>1</u>	<u>00</u>
19th	-	-	-	-	-	-	--	-	-	--
20th	-	-	-	-	-	-	--	-	-	--
21st	-	-	-	-	-	-	--	-	-	--
22nd	-	-	-	-	-	-	--	-	-	--
23rd	-	-	-	-	-	-	--	-	-	--

## OFFICIAL INJURY DATA - SOFT TISSUE INJURIES

Autopsy

Indicate the Location, Lesion, Detail (size, depth, fracture type, head injury clinical signs and neurological deficits), and Source of all injuries indicated by official sources (or from PAR or other unofficial sources if medical records and interviewee data are unavailable.)

- Ejected through sun roof. Vehicle landed partially on top of body. The front bumper was at the back of the deceased's head as he laid face down on the ground.



Cause of Death: ... injury of head & chest

Notes: ...

... ..

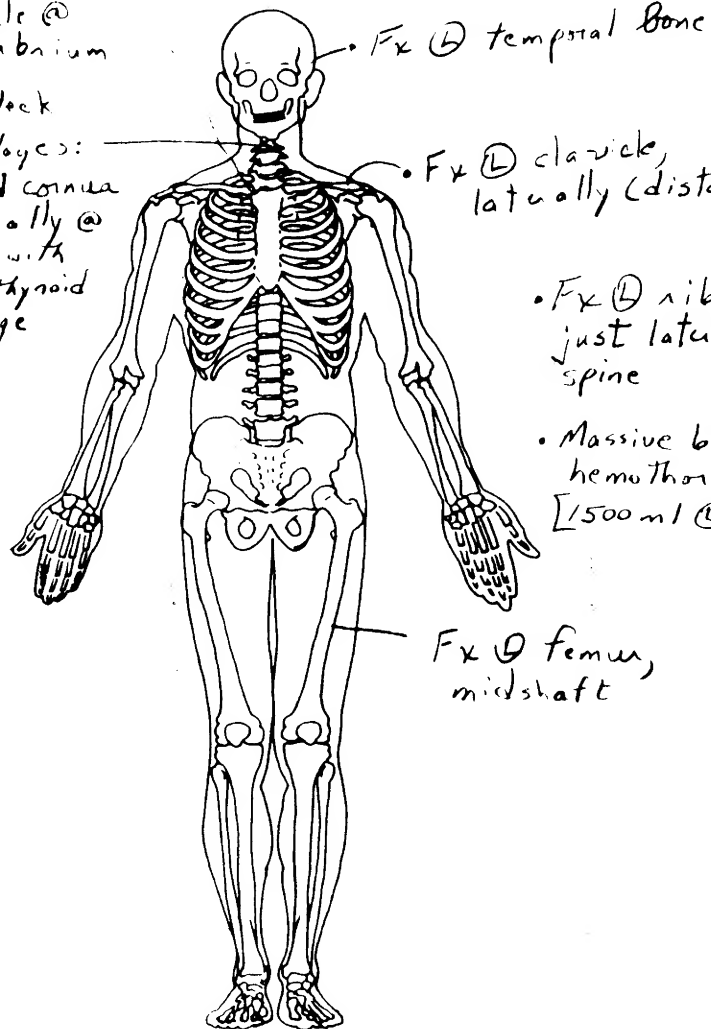
BAL = 0.08 (7c mg/L)

## OFFICIAL INJURY DATA – SKELETAL INJURIES

Indicate the Location, Lesion, Detail (size, depth, fracture type, head injury clinical signs and neurological deficits), and Source of all injuries indicated by official sources (or from PAR or other unofficial sources if medical records and interviewee data are unavailable.)

- Fx + dislocation (X)  
clavicle @  
manubrium

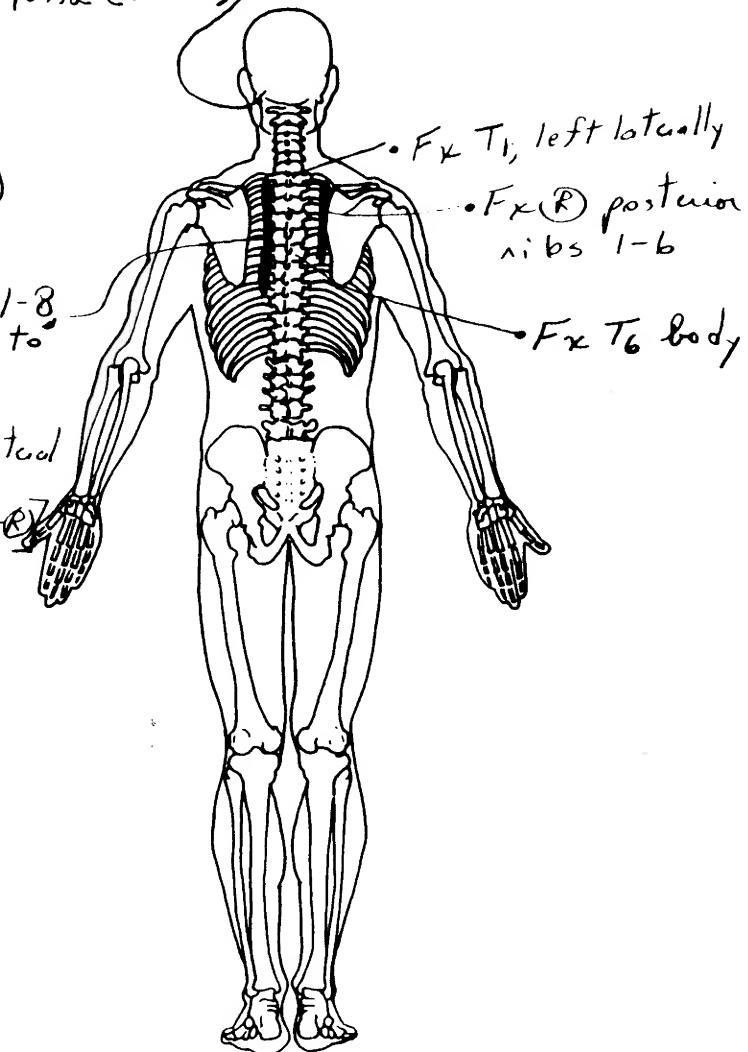
- Fx Neck  
Cervical:  
thyroid cartilage  
bilaterally @  
corner with  
body of thyroid  
cartilage



- Fx (L) posterior  
fossa (basilar)

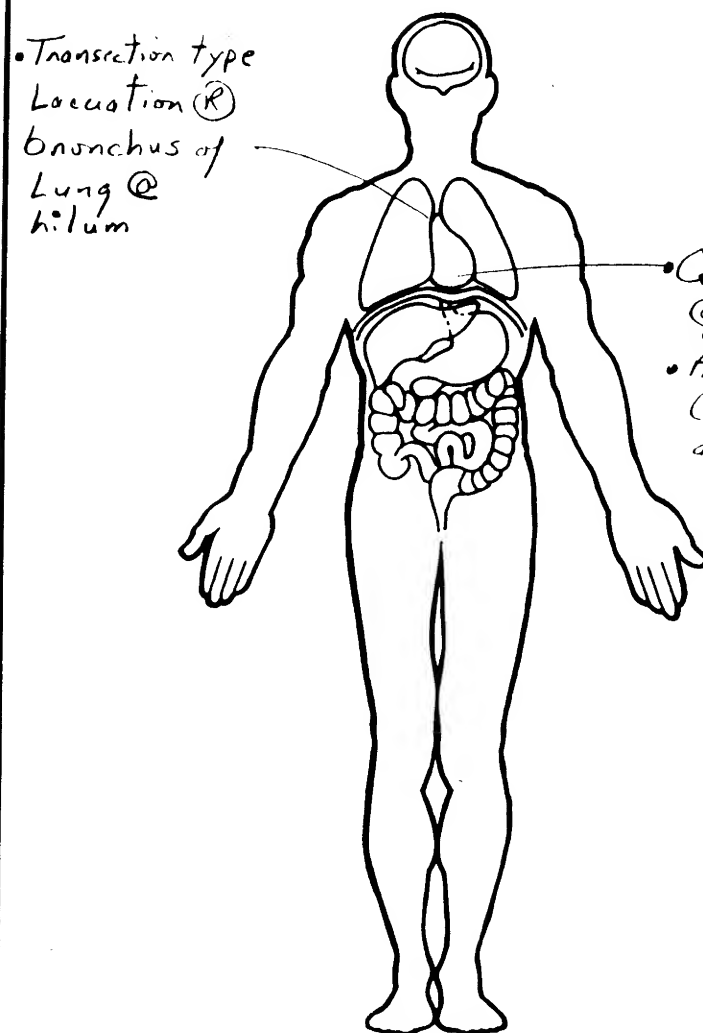
- Fx (L) ribs 1-8  
just lateral to  
spine

- Massive bilateral  
hemothorax  
[1500 ml (L) + (R)]

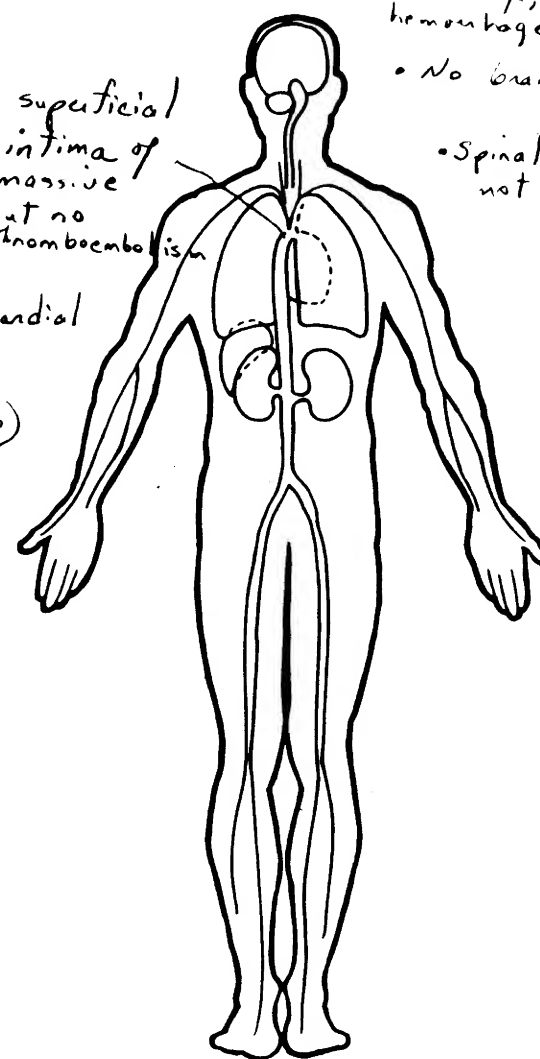


## OFFICIAL INJURY DATA - INTERNAL INJURIES

Indicate the *Location*, *Lesion*, *Detail* (size, depth, fracture type, head injury clinical signs and neurological deficits), and *Source* of all injuries indicated by official sources (or from PAR or other unofficial sources if medical records and interviewee data are unavailable.)



• Multiple superficial  
tears of intima of  
aorta; massive  
embolism but no  
pulmonary thromboembolism



AUTOPSY REPORT

Name: [REDACTED]

Autopsy No. [REDACTED]

Age: 33 years

Date: [REDACTED]

Sex: Male

Time: [REDACTED]

Performed by: [REDACTED] M.D.

Performed for: [REDACTED]

ANATOMIC FINDINGS

1. Blunt force injury of the head:
  - a. Laceration, left face
  - b. Fracture, temporal, left
  - c. Fracture, basilar, posterior fossa, left
2. Blunt force injury of the neck
  - a. Fracture, laryngeal, thyroid, cornu, bilateral
  - b. Fracture, thoracic vertebra, one
  - c. Fracture, clavicle, left, lateral
  - d. Fracture dislocation, clavicular/manubrial, right
3. Blunt force injury of the chest:
  - a. Multiple fractures of ribs 1-6 posterior right, 1-8 posterolateral left
  - b. Contusion, heart, base
  - c. Laceration, lung, bronchus, right
4. Fracture, femur, midshaft, left

TOXICOLOGY

Pending

CAUSE OF DEATH

Multiple Blunt Force and Crushing Injury of Head and Chest

MANNER OF DEATH

Accident (Motor Vehicle/Driver/Ejected)

[REDACTED] Ph.D., M.D.

[REDACTED], M.D.

### CIRCUMSTANTIAL SUMMARY

This 33 year old white male, DOB [REDACTED], resident of [REDACTED] Street in [REDACTED] Indiana was apparently exhibiting erratic driving which illicited pursuit by police. He ran off the end of the roadway at a high rate of speed at [REDACTED] on [REDACTED]. He was ejected through the sun roof of his late model Ford Mustang which was rotating to the left. The car made a complete rotation landing on the tires some 240 feet from the roadway and partially on top of his body. The front bumper was at the back of the deceased's head as he laid face down on the ground.

### DOCUMENTS AND EVIDENCE EXAMINED

Telephone conversation with [REDACTED] of the [REDACTED]

### X-RAYS

None.

### IDENTIFICATION

On [REDACTED] at [REDACTED] a complete post mortem examination was performed on the body of [REDACTED] who was identified by [REDACTED]. Also present for the autopsy included Mr. [REDACTED] and Cpt [REDACTED].

CLOTHING AND VALUABLES: Grey golf shirt with fine blue and red transverse stripes, brown oxfords, black socks and blue jeans with white jockey shorts.

### EXTERNAL EXAMINATION

The body is that of a well developed, well nourished white male adult appearing the stated age of 33 years. The body length is 75 inches and the body weight is 180 pounds. Scalp hair is red-brown. There is a full, well-trimmed mustache and beard. Jaundice is not present in the skin or sclerae.

The head is normocephalic. The irides are blue and the sclerae are white. The pupils are round and equal in diameter. There are no contact lenses present and there are no conjunctival petechia. The nose is unremarkable. There is mucus and blood in the nares and mouth. Teeth are present. There is no denture. Oral hygiene is good. The ears are not pierced.

There is no significant increase in the anteroposterior diameter of the chest. The breasts are symmetrical without palpable masses and the nipples appear normal without discharge. The abdomen is soft without significant ascites. The external genitalia are those of a short foreskin male adult. The anus is not dilated and measures 2cm with no evidence of injury.

The extremities are symmetric and there are no significant deforming blunt force or penetrating injuries.

The following scars, nevi and tattoos are present: There is a professionally done tattoo of an eagle on the lateral aspect of the right upper arm.

SIGNS OF DEATH: Rigor mortis is generalized and post mortem lividity is scant but purple and fixed on the posterior surface of the body.

ARTIFACTS: The following artifacts of medical and post mortem care are present: None.

The following artifacts of putrefaction are present: None.

### INJURIES

There are multiple linear sliding abrasions on the face and anterior body arranged along the long axis. These and the clothing are smeared with grey-brown granular soil. There is a deforming fracture of the left mid-shaft of the femur. There are multiple fractured ribs both posteriorly and some anteriorly. There is contusion of the base of the heart and transection of the right bronchus at the hilum.

There is contusion of the sternocleidomastoid muscle bilaterally with fracturing of the corner of the thyroid cartilage bilaterally at their junction with the body. The left cornu is angled medially.

The first thoracic vertebra is fractured left laterally. The 6th thoracic vertebra is fracturing through the body. All the ribs 1-8 are fractured on the left just lateral to the spine. Similar fractures are seen 1-5 on the right.

There is a fracture dislocation of the clavicle on the manubrium on the right and a distal fracture of the left clavicle.

### INTERNAL EXAMINATION

SEROUS CAVITIES: The body cavities are opened with a standard Y-shaped incision. The cranial cavity is opened with a coronal incision of the scalp and removal of the calvarium. An odor like alcohol is not apparent in the body cavities. The lungs are well aerated and fill the pleural cavities. There is massive bilateral hemothorax and air in the heart and thoracic vein.

There is no evidence of pneumothorax. There is 1500 ml of blood in the right and left pleural cavities. The pleural surfaces are smooth and glistening and there are no pleural adhesions. There is no blood or excess fluid in the pericardial sac. There is no evidence of pericarditis. There is no evidence of peritonitis. There is no blood in the peritoneal cavity. There is no ascitic fluid. After removal of the organs from the body, inspection of the serous cavities reveals extensive fracturing of the ribs, manubrial clavicle and vertebral column as previously reported. There is no evidence of fracture of the pelvic bones. Contusion hemorrhage is present in the body walls.

NECK ORGANS: The larynx and trachea are in the midline. The neck dissection is performed following removal of the thoracoabdominal viscera. Moderate hemorrhage is present in the skin, fat and sternocleidomastoid muscles of the anterior neck especially on the right. The strap muscles are free of hemorrhage. The thyroid gland is symmetrical and composed of reddish-brown parenchyma. There is no hemorrhage in the intrinsic muscles of the larynx, except for the pharyngeal muscles bilaterally in association with the fractures of the cornu of the thyroid cartilages. The other laryngeal cartilages and hyoid bone are not fractured. There is no obstruction of the respiratory tract in the nasopharynx, larynx or trachea. There is scant blood in the larynx. The mucosa of the hypopharynx, larynx and trachea is smooth and glistening without ulceration or tumor. The arytenoid muscles are free of hemorrhage. Cervical lymph nodes are appropriate for age.

THYMUS: The thymus is present in the anterior mediastinum and appropriate in size for age. There are many petechiae in the thymus.

HEART: The 400 gram heart is in usual position with respect to the great vessels and chest cavity. The left ventricle is firm. The left ventricle is slightly hypertrophied but the cardiac chambers are not dilated. On opening the aorta and pulmonary trunk, there is massive embolism but no evidence of pulmonary thromboembolism. There is no evidence of pericarditis. There are no epicardial petechia. The circumflex coronary artery arises from the left main coronary. The coronary arteries are examined by multiple cross sections. There is focal, soft yellow atherosclerotic plaque in the left anterior descending and right coronary arteries.

The left main coronary artery is not narrowed by plaque. The left anterior descending coronary artery is focally 25%-50% narrowed by plaque. The circumflex coronary artery is focally less than 25% narrowed by plaque. The right coronary artery is focally 25%-50% narrowed by plaque.

Thrombosis of a coronary artery is not present. The cardiac valve leaflets are delicate, translucent and membranous. The circumferences of the cardiac valves are within normal limits for age and heart size.

There is no softening or mottling of the myocardium due to recent myocardial infarction or necrosis. There is no myocardial fibrosis. There is no myocardial contusion. There are no defects in the atrial or ventricular septa. The ductus arteriosus is not patent. Autolysis is not significant.

VASCULAR SYSTEM: The aorta and its main branches show mild yellow streak atherosclerosis. There are multiple superficial tears of the intima of the aorta. These measure from 0.3 to 0.8 cm. There is no evidence of aneurysm, coarctation or dissection of the aorta. The renal arteries are not stenotic.

LUNGS: Right: 380 grams. Left: 320 grams. There is no atelectasis. The trachea is complete, without malformation, from the larynx to the carina. The right mainstem bronchus is lacerated at the hilum. There is no aspirated gastric material and no aspirated blood in the trachea. The distal bronchi contain scant mucus. The pleural surfaces are smooth and glistening. No petechiae are visible. The lungs and hilar nodes are mildly anthracotic and there is no bullous emphysema. On cut section, there is no aspirated blood apparent in alveoli. Bronchopneumonia is not recognized. There is no focal consolidation and no tumor. There is no significant passive congestion of the lungs. There is no evidence of pulmonary edema. There is no pulmonary contusion. Pulmonary thromboemboli are not present. There is no putrid gas cavitation.

LIVER: The 2100 gram liver has a smooth capsular surface. On cut section, the parenchyma is reddish-brown and has a lobular architecture. The liver is not significantly passively congested. Metastatic tumor is not present. The hepatic duct is patent. The gallbladder is present and contains about 20 cc green viscid bile. There are no gallstones. Autolysis of the liver is not significant.

PANCREAS: The pancreas is appropriate in shape and size with respect to total body fat stores. On cut surface, it is lobular with interspersed fat without focal calcification, fibrosis, hemorrhage and/or fat necrosis. Autolysis is not significant.



GASTROINTESTINAL SYSTEM: The esophagus is lined with glistening white mucosa. The stomach is coarsely rugated. The stomach contains 400 ml of partially digested food. There is an odor like alcohol in the stomach. There are no erosions or ulcers in the stomach or duodenum. The small bowel and colon are intact without perforation, diverticula or palpable tumors. The vermiform appendix is present.

SPLEEN: The 140 gram spleen is composed of firm red and white trabecular pulp. There is no laceration of the splenic capsule. Autolysis is not significant.

ADRENALS: Two adrenals are present with golden brown cortex and white medulla. No cortical nodules are present in either adrenal. Autolysis is not significant.

URINARY TRACT: Right kidney: 200 grams. Left kidney 220 grams. The two kidneys, ureters and a bladder are present in their usual positions without collecting system dilatation. The kidneys are symmetrical in shape and size. The capsules strip from the cortices with ease and the cortical surfaces are smooth. On cut section, the cortex appears of ample thickness and the medulla appears ample. The kidneys are not congested. There are no stones or tumors in the kidneys, pelvis, ureters or bladder. The mucosa of the urinary bladder appears glistening. Autolysis of the kidneys is not significant.

REPRODUCTIVE SYSTEM: The prostate is slightly enlarged. The testes are descended into the scrotum and are usual in size for the age. On cut section, the testes and epididymides appear unremarkable.

CENTRAL NERVOUS SYSTEM: There is hemorrhage in the scalp and galea in the left parieto-temporal area. The dura, removed by stripping from the calvarium and base of the skull, shows no epidural or subdural hemorrhage. The cerebral and cerebellar hemispheres of the 1380 gram brain are symmetrical. The leptomeninges are transparent and can be stripped with ease. There is no subarachnoid hemorrhage. There is no flattening of the gyri and no widening of the sulci. The major vessels at the base of the brain have a usual anatomic distribution and there is no significant atherosclerosis. The cranial nerves are symmetrical and intact. There is no evidence of herniation at any of the portals of the brain. On serial coronal sectioning of the brain, there is no internal evidence of contusion, edema, hemorrhage, tumor, atrophy, infection or infarction in the cerebrum, cerebellum and brain stem. There are no fractures of the convexity or base of the skull. The craniocervical junction demonstrates a usual range of motion. The spinal cord is not examined.

PHOTOGRAPHS: Departmental.

SPECIMENS FOR FIREARMS EXAMINATION OR TRACE EVIDENCE: None.

SPECIMENS FOR TOXICOLOGY: Vitreous, blood, urine, bile, gastric contents, liver tissue and kidney tissue.

SPECIMENS FOR CHEMICAL ANALYSIS: None.

SPECIMENS FOR CULTURE: None.

MICROSCOPIC EXAMINATION: Tissue samples representative of the major organs have been processed onto glass slides for microscopic examination. These histologic specimens have been examined and there are no additional significant pathologic findings other than those noted on the Anatomic Findings.

CERTIFICATE OF ANALYSIS

TO: [REDACTED] Ph.D

cc: [REDACTED]

[REDACTED], IN [REDACTED]

Your Case # [REDACTED]

Subject: [REDACTED]

Toxicology Case # [REDACTED]

Date Received: [REDACTED]

Evidence Submitted By: [REDACTED]

SPECIMENS SUBMITTED:

<u>Type</u>	<u>Volume/Amount</u>	<u>Condition</u>
Blood	100 ml	Sealed, Fresh, Not Contaminated
Urine	110 ml	Sealed, Fresh, Not Contaminated
Bile	3 ml	Sealed, Fresh, Not Contaminated
Stomach Contents	90 ml	Sealed, Fresh, Not Contaminated
Vitreous Fluid	2 ml	Sealed, Fresh, Not Contaminated
Kidney Tissue	210 grams	Sealed, Fresh, Not Contaminated
Liver Tissue	290 grams	Sealed, Fresh, Not Contaminated

RESULTS OF ANALYSES:

<u>Specimen</u>	<u>Drug/Chemical Identified</u>	<u>Concentration</u>
Blood	Ethanol	76 mg/dl (0.07%)
Blood	Carbon Monoxide	Less Than 10%
Urine	Cocaine	None Detected
Urine	Other Drugs	None Detected

Comments:

[REDACTED]